Technical training.
Product information.

Headunit High

BMW Service

General information

Symbols used

The following symbol is used in this document to facilitate better comprehension or to draw attention to very important information:

⚠️

Contains important safety information and information that needs to be observed strictly in order to guarantee the smooth operation of the system.

Information status and national-market versions

BMW Group vehicles meet the requirements of the highest safety and quality standards. Changes in requirements for environmental protection, customer benefits and design render necessary continuous development of systems and components. Consequently, there may be discrepancies between the contents of this document and the vehicles available in the training course.

This document basically relates to the European version of left-hand drive vehicles. Some operating elements or components are arranged differently in right-hand drive vehicles than shown in the graphics in this document. Further differences may arise as a result of the equipment specification in specific markets or countries.

Additional sources of information

Further information on the individual topics can be found in the following:

- Owner's Manual
- Integrated Service Technical Application.

Contact: conceptinfo@bmw.de

Reprints of this publication or its parts require the written approval of BMW AG, Munich

The information contained in this document forms an integral part of the technical training of the BMW Group and is intended for the trainer and participants in the seminar. Refer to the latest relevant information systems of the BMW Group for any changes/additions to the technical data.

Information status: **March 2012**
BV-72/Technical Training

Headunit High
Contents

Headunit High

Contents

Headunit High

Contents

Headunit High

1. Introduction

1.1. Headunit history

Although the E65 (7 Series) introduced the iDrive concept it wasn't until the launch on the E63 (6 Series) in 2003 that the first **headunit** was introduced at BMW under the name **Car Communication Computer (CCC)**. This device combined the tuner functions (radio), navigation, speech processing, a user interface and a DVD/CD drive in one component (for the first time in a BMW vehicle). For this reason this central control unit was referred to as the headunit. With the launch of the F01 (in the fall of 2008) the 2nd generation Headunit High the Car Information Computer (CIC) was introduced.

CIC was a completely revised control concept with one of the highlights being an integrated hard drive, on which both the map data for the navigation and a music collection with relevant music track database (Gracenote®), were stored. Numerous external receivers (IBOC, SDARS) were also gradually incorporated into the headunit hardware. BMW Assist and BMW Online were supplemented with Google Search and displayed in the menu BMW Services or ConnectedDrive (from 03/2011). The Active Voice Recognition was further developed and supplemented with a one-shot destination input.

Gen.	Option code	Marketing	Technical Training	Diagnosis	Series introduction
1	609	Navigation Professional	Car Communication Computer **(CCC)**	Car Communication Computer **(CCC)**	E63 (2003)
2	609	Navigation Professional	Car Information Computer **(CIC)**	Car Information Computer **(CIC)**	F01 (2008)
3	609	Navigation Professional	Headunit High **(HU–H)**	Headunit High **(HU–H)**	F01 LCI (2012)

1.2. 3rd Generation Headunit High

The 3rd generation of the Headunit High introduced in July 2012 is part of the model upgrade for the 7-Series Life Cycle Impulse (LCI) as well as for the 5-Series sedan and Gran Turismo. The Headunit High will also be installed in the F30 hybrid and F31 as from their market launch.

1.3. New features

The CIC user interface has been completely revised and upgraded with a futuristic (3D effect) enhanced perspective view. The structure of the individual menus is now shown in virtual high resolution with enhanced graphics. The symbols on the symbol bars have been standardized and a variety of movements and animations have also been added. Images of vehicles and objects (previously only visible in the Options menu) have now been integrated directly in the submenus for a more sophisticated and ultra modern look and feel.

Headunit High

1. Introduction

Main menu and start screen; comparison of CIC (left) to Headunit High 3rd Generation HU-H (right)

The hardware was completely revised and is now equipped with a new 1.3 GHz processor, 1 GB working memory, 8 GB flash memory and a **200 GB SATA hard disk.** And as with the earlier headunits, the flash memory and hard disk cannot be replaced.

The music collection has been enhanced and equipped with new functions (e.g. favorites).

The USB interface in the center console can now play **video files**, as well as audio files. It is also used for importing/exporting data and updating navigation maps, as the USB in the glove compartment has been discontinued.

New to the **IBOC** is the display of album art and station logos (these are only displayed if the station provides such content over the HD digital signal)

With regard to telephone/connectivity, **the main telephone and additional telephone are now handled equally for the first time** and shown together in the Office menu. The Combox media was integrated in the headunit complete with all functions and interfaces. In addition, the headunit-supported telephone service (SA6NH) was integrated and has made redundant the use of the Combox media.

The Combox with telematics functions has been replaced with its successor, the **Telematic Communication Box (TCB)**.

The **Rear Seat Entertainment system (RSE)** was completely revised and equipped with new hardware (RSE control unit and new rear monitors) with new functions like zoning, serving function. But the big addition to RSE would be the ability to use Navigation and set destinations from the rear seat. F01 vehicles with the ZRP option (Rear Entertainment Package) will have the controller integrated into the center armrest of the backseat while the other vehicles will use a wireless remote control.

The Headunit High is equipped with a **message dictation "Speech-to-text" function** to answer and compose text messages and emails directly via the iDrive and the use of a BMW "Tested" phone. A **Voice memo function** is also available where voice memos can be recorded , saved to a USB or sent via email as sound files.

Headunit High

1. Introduction

1.4. Glossary

1.4.1. Streaming

The process of data transfer for audio or video files is called "streaming", "livestream" or in brief "stream". The data in this case is transmitted via radio. The significant difference to the radio is that there the transmitted data can be received from a variety of receivers. In the case of streaming a point-by-point connection between the media server of the sender and the receiver is realized for each user as per his requirements, etc. In this regard the complete file does not have to be sent to the receiver to start playback. Playback can take place for the receiver as soon as the transmission has started. Examples for streaming include the Bluetooth audio streaming.

1.4.2. Codec

Codec (made-up word from English **co** der and **dec** oder) is a procedure, which codes and decodes data or signals using digital means. Video or audio files are not changed during coding without any loss, but a dynamic reduction of the signal, as well as data compression, are performed, which result in deteriorations in quality depending on the extent and procedure. An example of this is the conversion of a CD digital audio file .wav to a compressed audio file .mp3. Video files can also be converted. An example of this is a .mov file converted using XviD Video codec to MPEG-4 video format.

Due to the decline in quality (which is generally not noticeable for the user) we can reduce the necessary bandwidth or the required memory capacity (example .wav 70MB to .mp3 approx. 7MB).

Furthermore, it is important to make a distinction between the coded data format, i.e. the audio and video format, and the **container format**.

1.4.3. Container

A container or container format is a file in digital data processing which can contain different files and file types.

Audio/Video container formats can contain at least one audio and video stream. Some formats also allow embedding of subtitles, menu structures or other content. A container format is thus only **the cover** for the files contained therein. A mpeg-4 container, for example a H.264 coded video, can be combined with a AAC audio or a Xvid coded video combined with MP3 audio. Containers are a basic requirement for video files, music also exists in a "raw" version, i.e. without the noise of containers. The content of a container is **not visible** from the outside.

Headunit High

1. Introduction
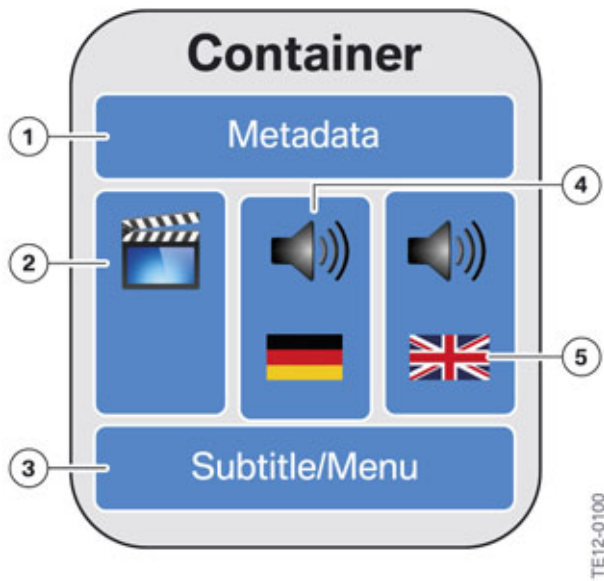
Container for audio/video formats

Index	Explanation
1	Metadata
2	Film file
3	Subtitle or menu information
4	Audio file with German-speaking sound
5	Audio file with English-speaking sound

Headunit High

2. Vehicle Introduction Scenario

The Headunit High will be available with the SA609 (Navigation) in the following BMW models:

Product line	Development series	Versions/Measure	Introduction dates
LG	F01, F02	BMW 7-Series LCI	**07/2012**
LG	F10, F07	BMW 5-Series Model Year Measure	**09/2012**
LG	F06	BMW 6-Series Gran Coupe	**03/2013**
LG	F12, F13	BMW 6-Series Convertible and Coupe	**03/2013**
LG	F25	BMW X3	**04/2013**
LK	F30 hybrid	BMW 3-Series	**07/2012**
LK	F30	BMW 3-Series	**07/2013**
LK	F31	BMW 3-Series	**04/2013**

Headunit High

3. System Wiring Diagrams

3.1. BMW 5-Series, 6-Series and 7-Series

3.1.1. Bus overview

Bus plan for the vehicles of the BMW 7-Series

Headunit High
3. System Wiring Diagrams

Index	Explanation
1	Control units with wake-up line
2	Control units authorized to perform wake-up function
3	Start-up node control units for starting and synchronizing the FlexRay bus system
ACC	ACC sensor (sensor and control unit for Active Cruise Control)
ACSM	Advanced Crash Safety Module
AL	Active steering
AMPT	Amplifier Top (top high fidelity amplifier)
ASD	Active Sound Design
CAS	Car Access System
CID	Central information display
CON	Controller
DME	Digital Engine Electronics (DME)
DME2	Digital Engine Electronics 2
DSC	Dynamic Stability Control
DVDC	DVD changer
EDCSHL	Electronic Damper Control satellite, rear left
EDCSHR	Electronic Damper Control satellite, rear right
EDCSVL	Electronic Damper Control satellite, front left
EDCSVR	Electronic Damper Control satellite, front right
EGS	Electronic transmission control
EHC	Electronic ride height control
EKPS	Electronic fuel pump control
EMF	Electromechanical parking brake
EPS	Electronic Power Steering (electromechanical power steering)
FCON	Rear compartment controller
FD	Rear compartment display
FD2	Rear compartment display 2
FKA	Rear climate control
FLA	High-beam assistant
FRM	Footwell module
FZD	Roof function center
GWS	Gear selector switch
HU-H	Headunit High (with SA609)
HKA	Automatic rear air-conditioning and heating

Headunit High

3. System Wiring Diagrams

Index	Explanation
HKL	Automatic operation of tailgate
HSR	Rear axle slip angle control
HUD	Head-Up Display
ICM	Integrated Chassis Management
IHKA	Integrated automatic heating / air-conditioning system
JBE	Junction box electronics
KAFAS	Camera-based driver support systems
K-CAN	Body controller area network
K-CAN2	Body Controller Area Network 2 (500 kBit/s)
K-CAN3	Body Controller Area Network 3 (500 kBit/s)
KOMBI	Instrument panel
LHML	LED main light module, left
LHMR	LED main light module, right
MOST	MOST
NVE	Night Vision Electronics
PDC	Park Distance Control
PMA	Parking Maneuvering Assistant
PT-CAN	Powertrain controller area network
PT-CAN2	Powertrain controller area network 2
OBD	Diagnostic socket
REMARE	Reversible electric-driven reel, right
REMALI	Reversible electric-driven reel, left
RSE	Rear Seat Entertainment system
SINE	Siren with tilt alarm sensor
SME	Battery management electronics
SMBFH	Seat module, passenger
SMFAH	Driver's seat module
STML	Headlight driver module, left
STMR	Headlight driver module, right
SVT	Servotronic module
SWW	Lane change warning
SZL	Steering column switch cluster
TCB	Telematic Communication Box
TPMS	Tire Pressure Monitoring System
TRSVC	Control unit for reversing camera and Side View

Headunit High

3. System Wiring Diagrams

Index	Explanation
VDM	Vertical Dynamics Management
VSW	Video switch
VTG	Transfer case control unit (xDrive only)
ZGM	Central gateway module

Headunit High

3. System Wiring Diagrams

3.1.2. Headunit High
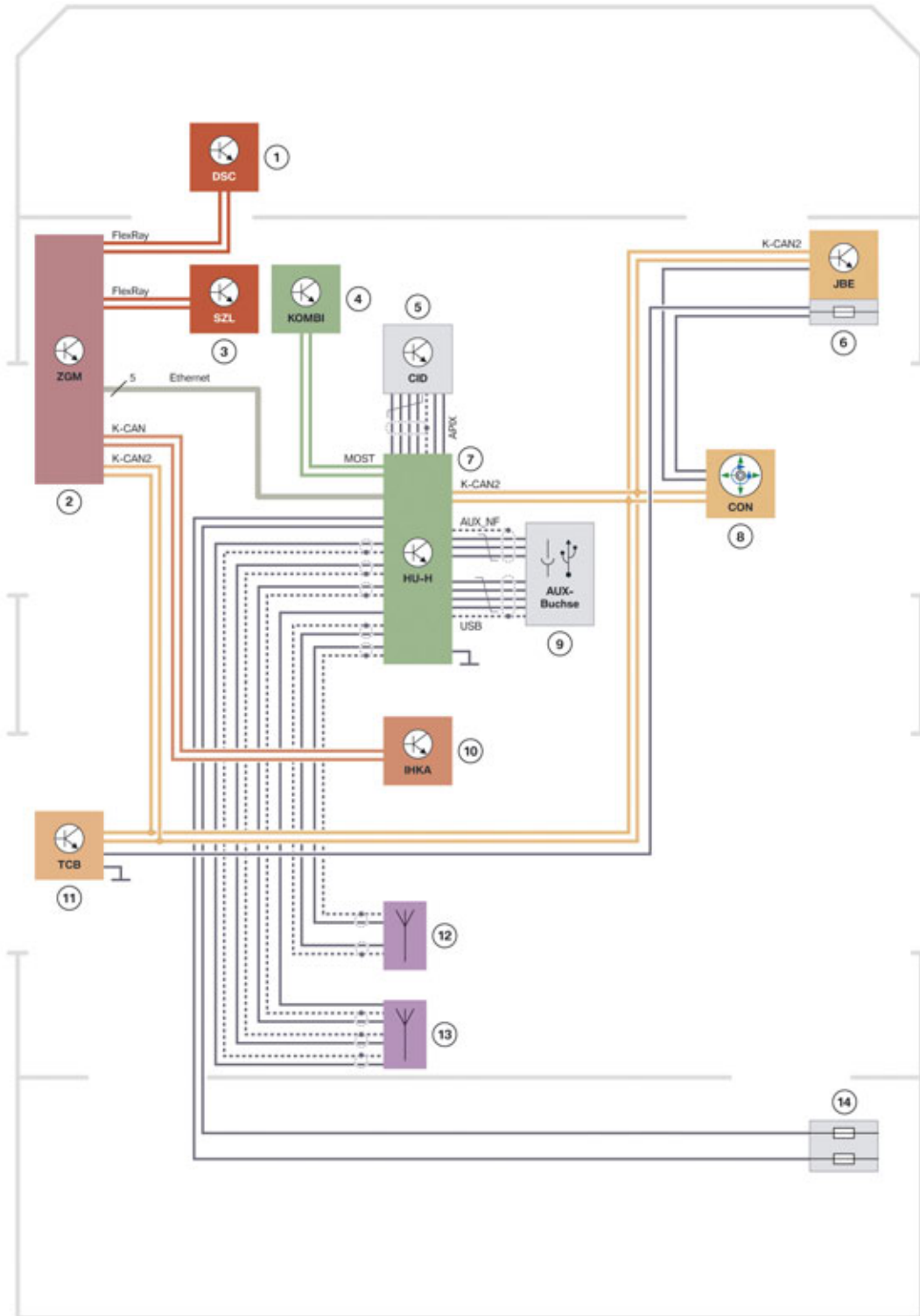
Headunit High of large series in the system network

Headunit High

3. System Wiring Diagrams

Index	Explanation
1	Dynamic Stability Control (DSC)
2	Central gateway module (ZGM)
3	Steering angle sensor (LWS) integrated in the steering column switch cluster (SZL)
4	Instrument panel (KOMBI)
5	Central information display (CID)
6	Junction box electronics (JBE) with front power distribution box
7	Headunit High
8	Controller (CON)
9	AUX-In connection with integrated USB audio interface
10	Integrated automatic heating / air-conditioning system (IHKA) with audio control panel
11	Telematic Communication Box (TCB)
12	Telematic antenna
13	Antenna amplifier for FM, AM, remote control service
14	Power distribution box, rear

Headunit High

3. System Wiring Diagrams

3.1.3. Versions with video switch
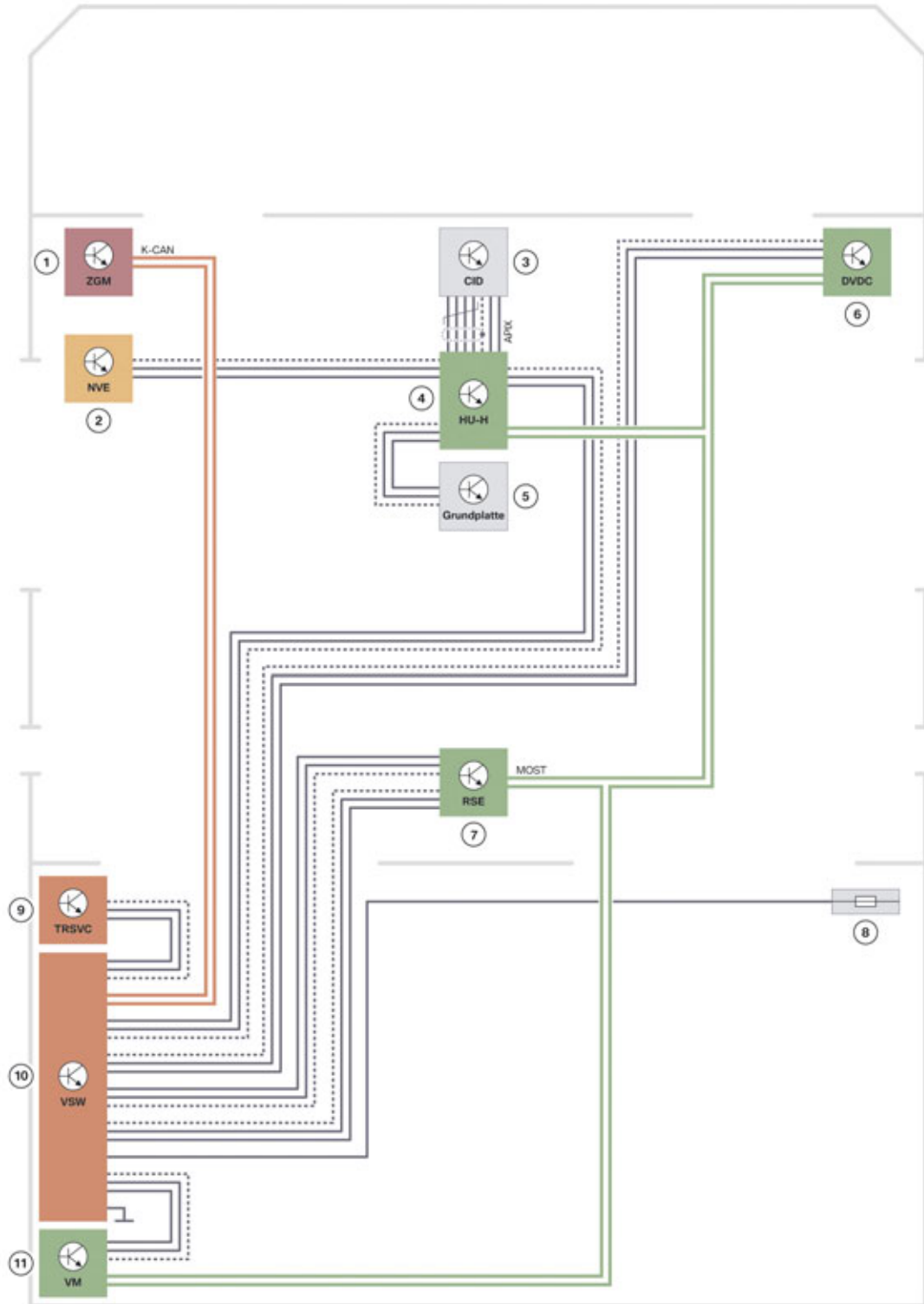
Headunit High in connection with a video switch

Headunit High

3. System Wiring Diagrams

Index	Explanation
1	Central gateway module (ZGM)
2	Night vision electronics (NVE)
3	Central information display (CID)
4	Headunit High
5	Video base plate
6	DVD changer (DVDC)
7	Rear seat entertainment (RSE)
8	Power distribution box, rear
9	Camera module for all-round vision camera (TRSVC)
10	Video switch (VSW)
11	Video module (VM) **Not for US**

Headunit High

3. System Wiring Diagrams

3.1.4. Rear seat entertainment RSE
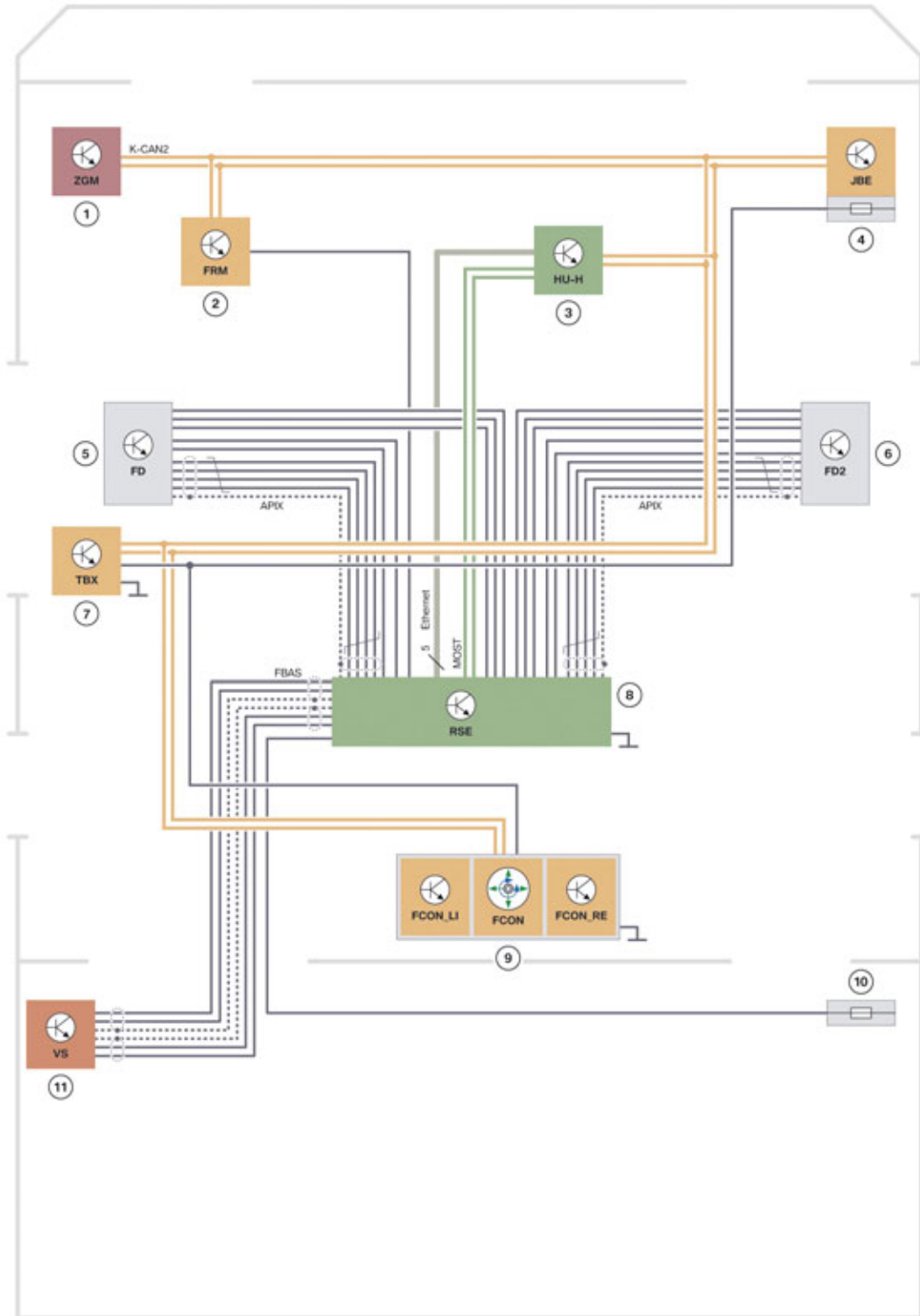
Headunit High in connection with Rear Seat Entertainment

Headunit High
3. System Wiring Diagrams

Index	Explanation
1	Central gateway module (ZGM)
2	Footwell module (FRM)
3	Headunit High
4	Junction box electronics (JBE) with front power distribution box
5	Rear monitor, rear left
6	Rear compartment display 2, rear right
7	Touch box for the touch controller (TBX) **Not for US**
8	Rear seat entertainment (RSE)
9	Rear-compartment controller (FCON) with version module for right and left side
10	Video switch (VSW)
11	Power distribution box, rear

Headunit High

3. System Wiring Diagrams

3.1.5. Connectivity
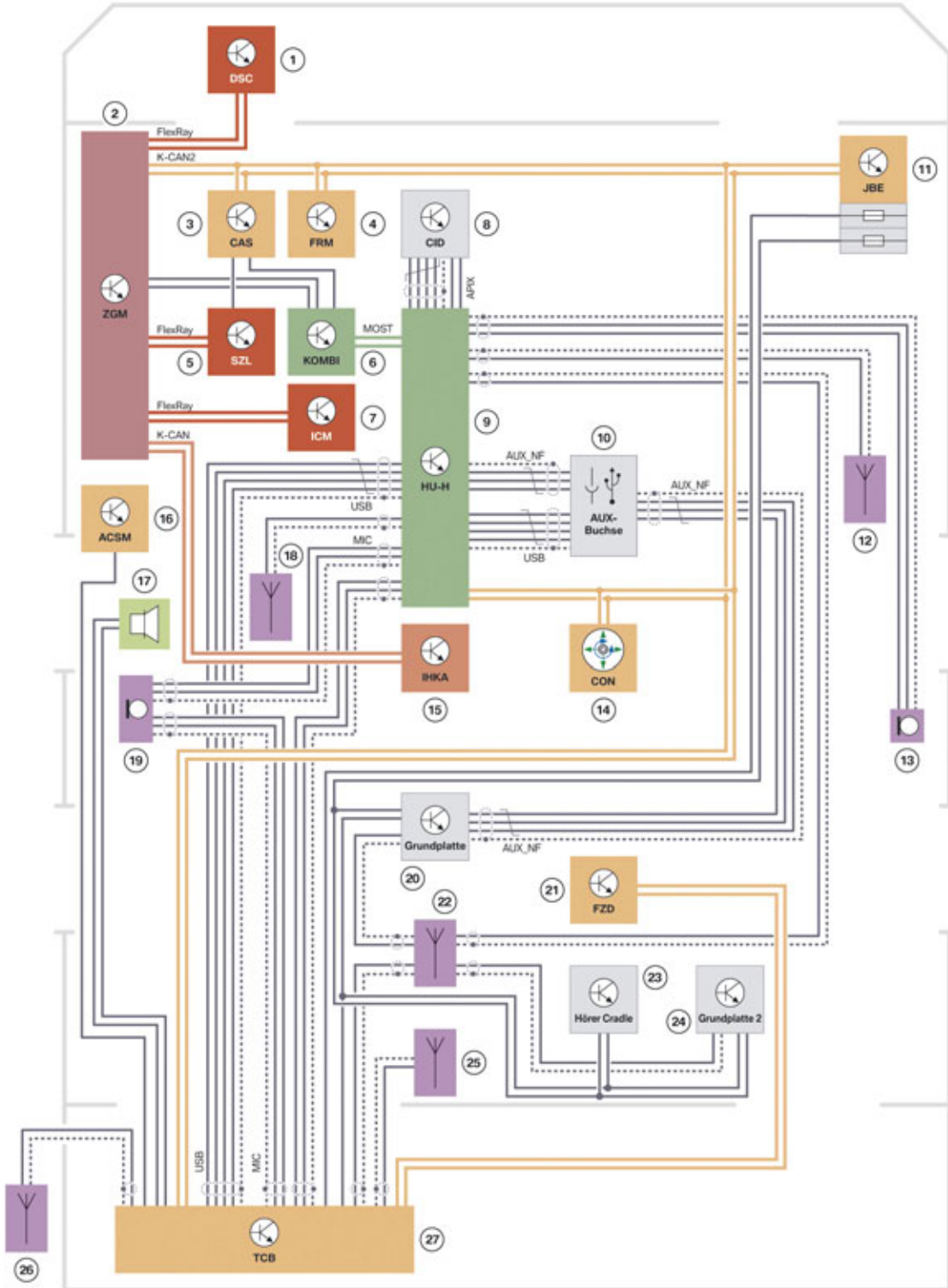
Headunit High Connectivity with telephone and telematic systems

Headunit High
3. System Wiring Diagrams

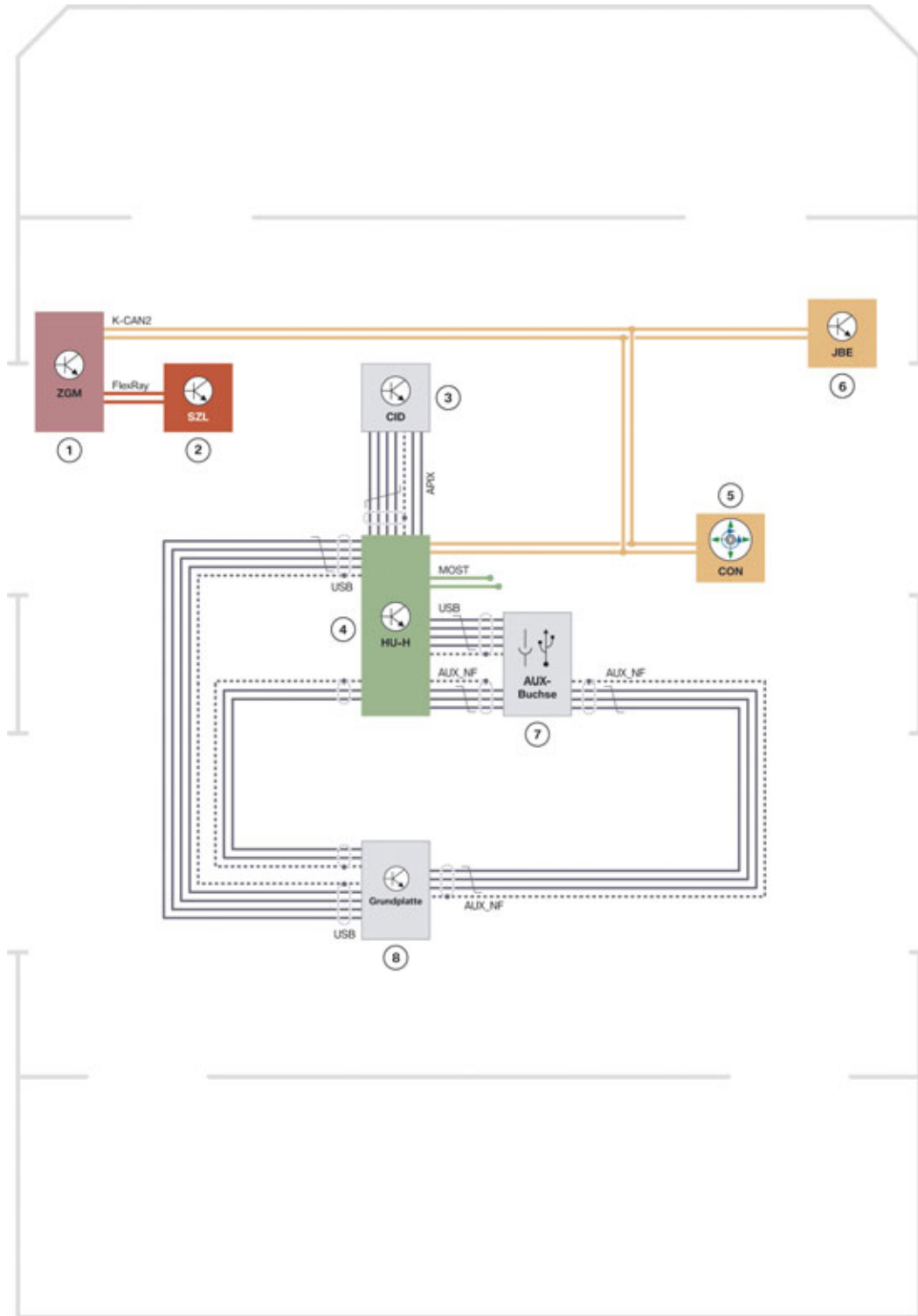| Index	Explanation
1	Dynamic Stability Control (DSC)
2	Central gateway module (ZGM)
3	Car Access System (CAS)
4	Footwell module (FRM)
5	Steering angle sensor (LWS) integrated in the steering column switch cluster (SZL)
6	Instrument panel (KOMBI)
7	Integrated Chassis Management (ICM)
8	Central information display (CID)
9	Headunit High
10	AUX-In connection with integrated USB audio interface
11	Junction box electronics JBE with front power distribution box
12	WLAN antenna for audio streaming (from 2013)
13	Microphone 2 for the front passenger (MIC2)
14	Controller (CON)
15	Integrated automatic heating / air-conditioning system (IHKA)
16	Crash Safety Module (ACSM)
17	Emergency loudspeaker
18	Bluetooth antenna
19	Microphone for the driver (MIC)
20	Video-compatible base plate for the telephone snap-in adapter
21	Roof function center (FZD) with emergency call button
22	Telematic antenna, GPS antenna.
23	Handset rest in the rear passenger compartment of the vehicle (Not for US)
24	Base plate in the rear passenger compartment of the vehicle (Not for US)
25	Emergency GSM antenna
26	Telephone antenna for the rear area in the bumper
27	Telematic Communication Box (TCB)

Headunit High
3. System Wiring Diagrams

3.1.6. Audio and video player integration

Headunit audio and video player integration

Headunit High
3. System Wiring Diagrams

Index	Explanation
1	Central gateway module (ZGM)
2	Steering angle sensor (LWS) integrated in the steering column switch cluster (SZL)
3	Central information display (CID)
4	Headunit High
5	Controller (CON)
6	Junction box electronics (JBE)
7	AUX-In connection with integrated USB audio interface
8	Video base plate

Headunit High

3. System Wiring Diagrams

3.2. BMW 3-Series

3.2.1. Headunit High
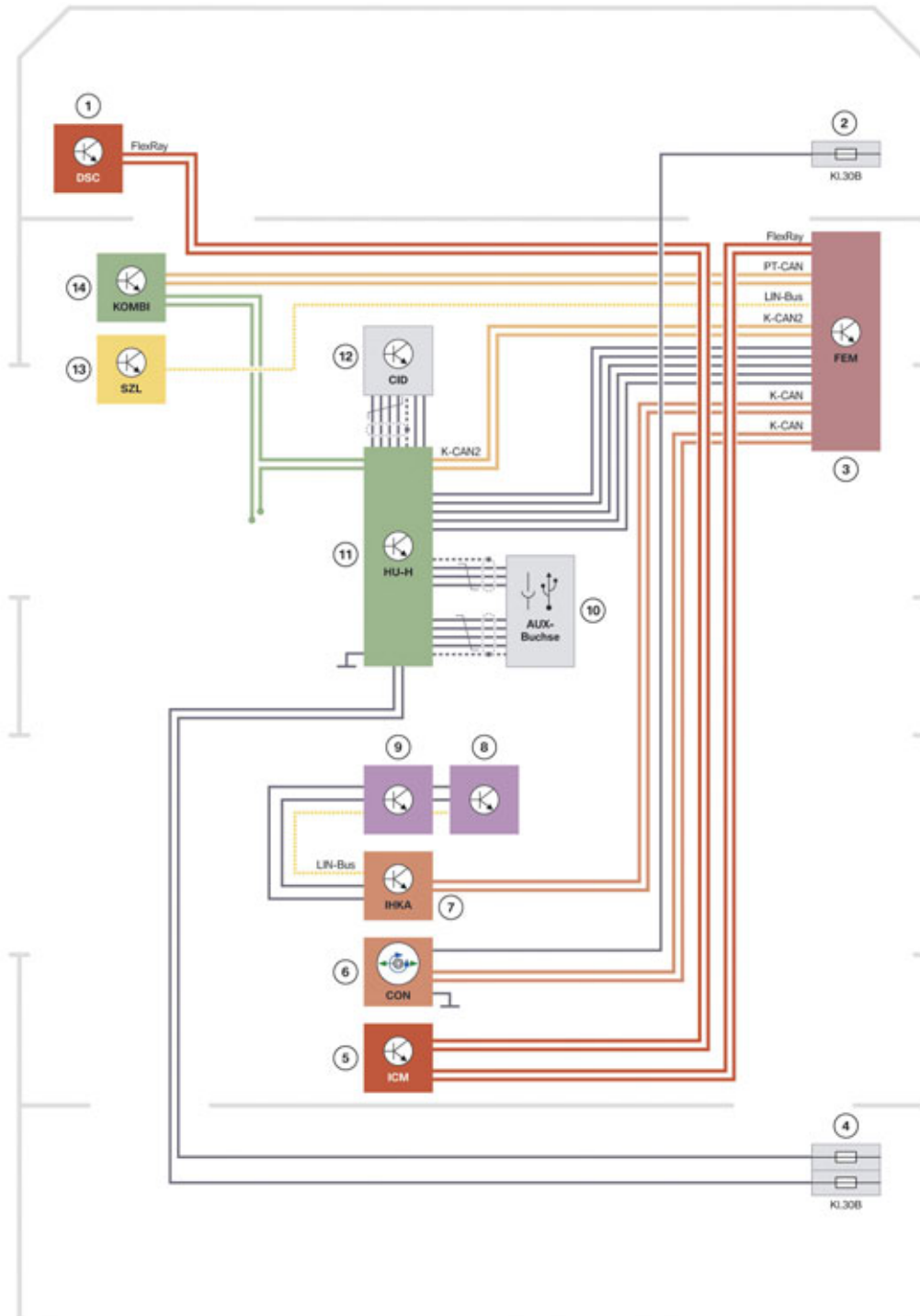
Headunit High in the system network (F30)

Headunit High
3. System Wiring Diagrams

Index	Explanation
1	Dynamic Stability Control (DSC)
2	Power distribution box, front
3	Front Electronic Module (FEM)
4	Power distribution box, rear
5	Integrated Chassis Management (ICM)
6	Controller (CON)
7	Control unit for integrated automatic heating / air-conditioning system (IHKA)
8	Control panel for heating and air-conditioning system
9	Control panel for Headunit High
10	USB port for external media and data import/export
11	Headunit High (HU-H)
12	Central information display (CID)
13	Steering column switch cluster (SZL)
14	Instrument panel (KOMBI)

Headunit High

3. System Wiring Diagrams

3.2.2. Connectivity
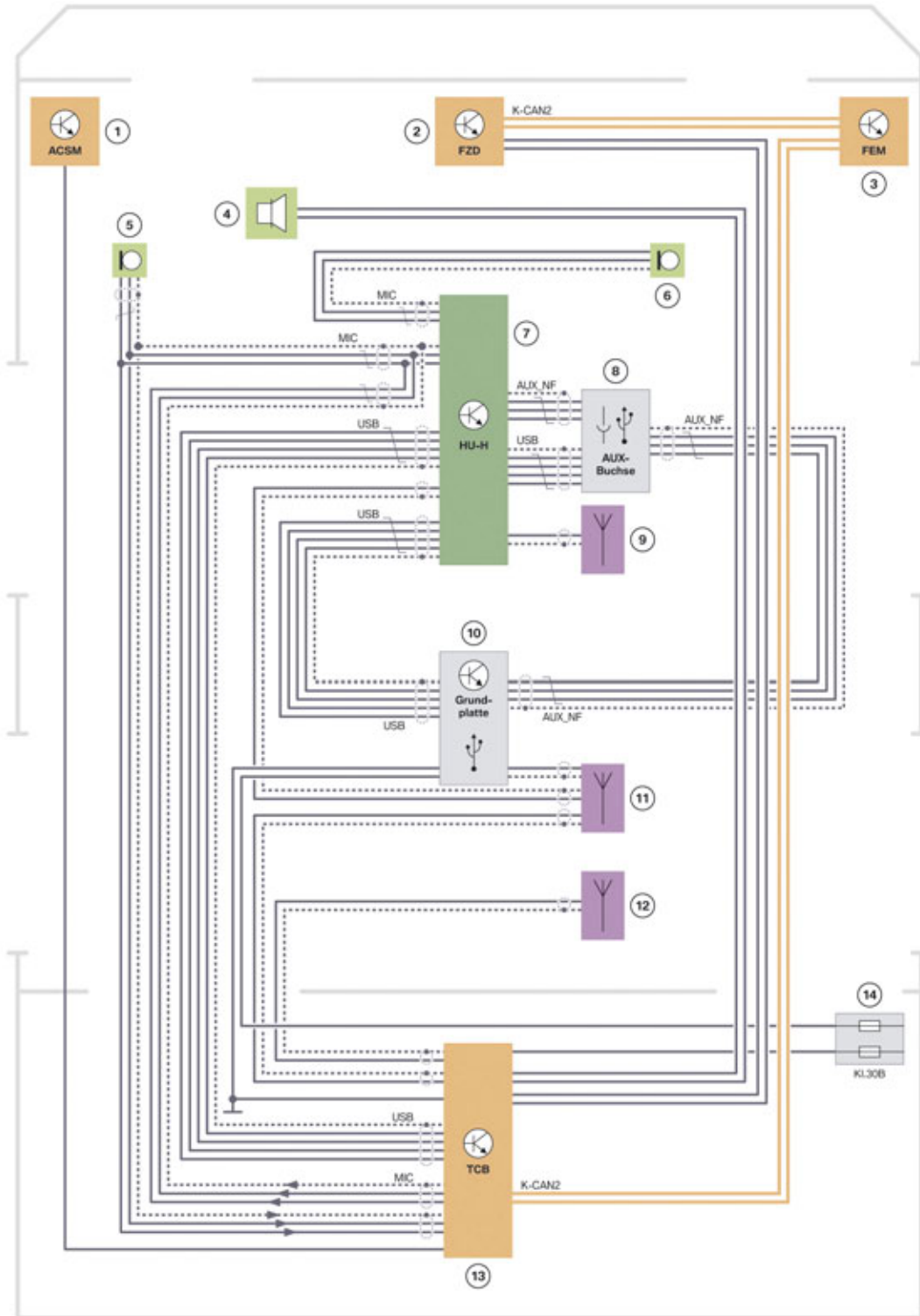
Headunit High Connectivity with telephone and telematic systems

Headunit High

3. System Wiring Diagrams

Index	Explanation
1	Crash Safety Module (ACSM)
2	Roof function center (FZD)
3	Front Electronic Module (FEM)
4	Emergency loudspeaker
5	Microphone for the driver (MIC)
6	Microphone 2 for the front passenger (MIC2)
7	Headunit High
8	AUX-In connection with integrated USB audio interface
9	Bluetooth antenna
10	Video-compatible base plate for the snap-in adapter
11	Cell telephone antennas, GPS
12	Emergency GSM antenna
13	Telematic Communication Box (TCB)
14	Power distribution box, rear

Headunit High

3. System Wiring Diagrams

3.3. BMW X3

3.3.1. Headunit High
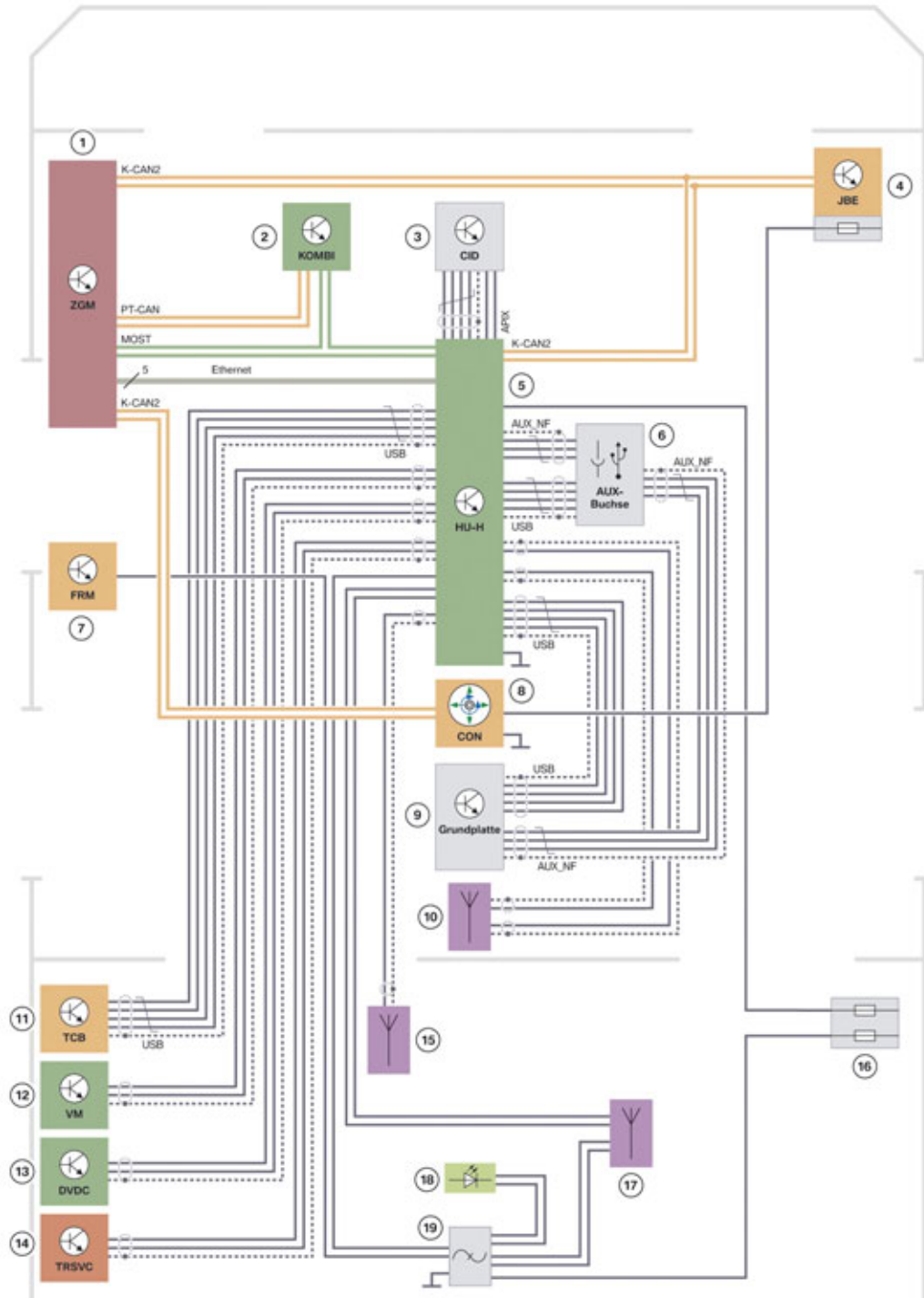
Headunit High in the system network (F25)

Headunit High

3. System Wiring Diagrams

Index	Explanation
1	Central gateway module (ZGM)
2	Instrument panel (KOMBI)
3	Central information display (CID)
4	Junction box electronics (JBE) with front power distribution box
5	Headunit High (HU-H)
6	AUX-In connection with integrated USB audio interface
7	Footwell module (FRM)
8	Controller (CON)
9	Video-compatible base plate for the snap-in adapter
10	Cell telephone antennas, GPS
11	Telematic Communication Box (TCB)
12	Video module (VM) (Not for US)
13	DVD changer DVD-C
14	Control unit for reversing camera and Side View (TRSVC)
15	**Not for US**
16	Power distribution box, rear
17	Antenna amplifier for FM, AM, remote control service
18	High-mounted brake light
19	Interference filter

Headunit High

4. System Components

4.1. Hardware of Headunit High

4.1.1. System overview of Headunit High
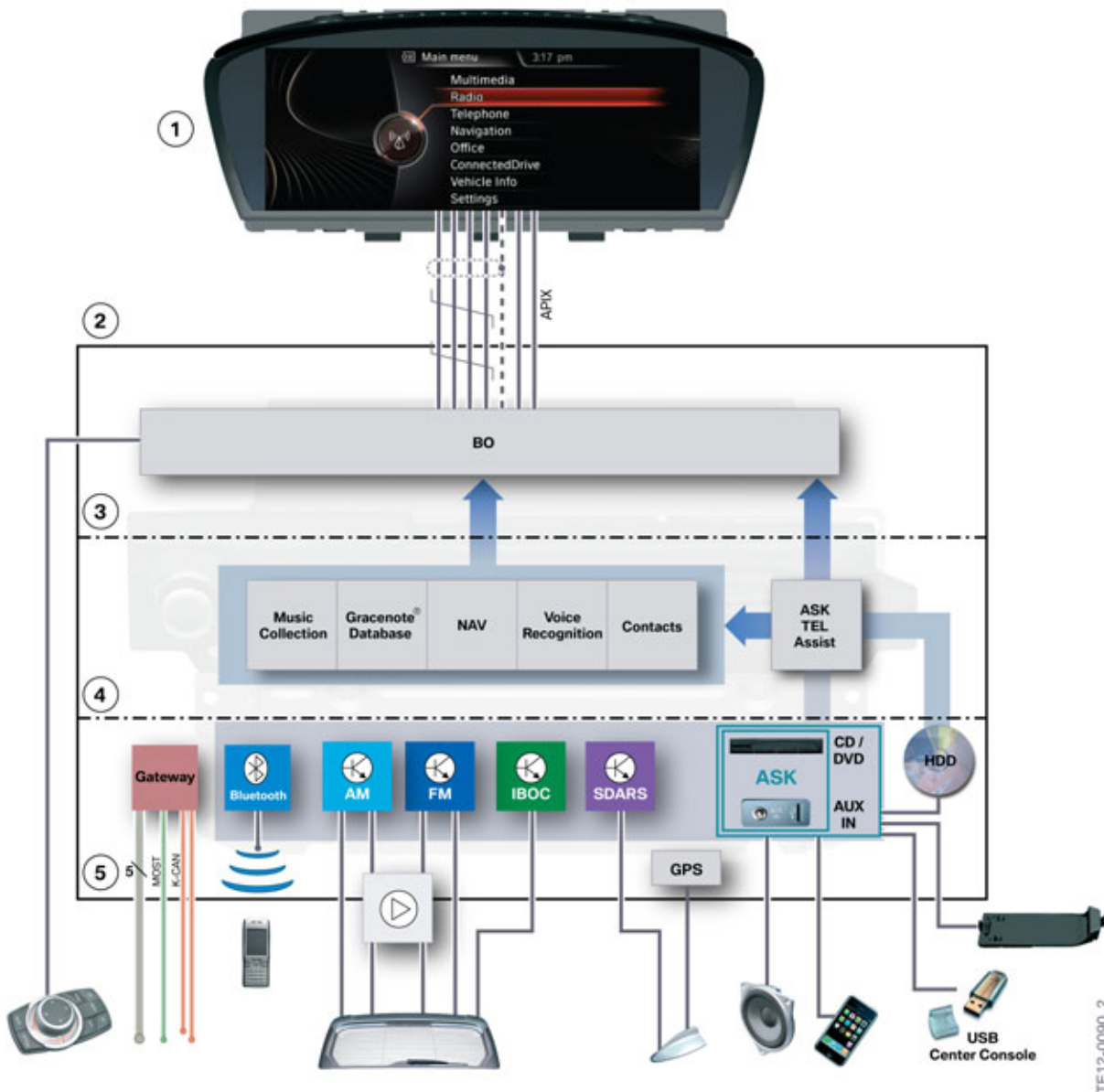
Block diagram of Headunit High

Headunit High

4. System Components

Index	Explanation
1	Central information display (CID)
2	Headunit High (HU-H)
3	User interface
4	Application software
5	Hardware and interfaces

4.1.2. Front view of Headunit High
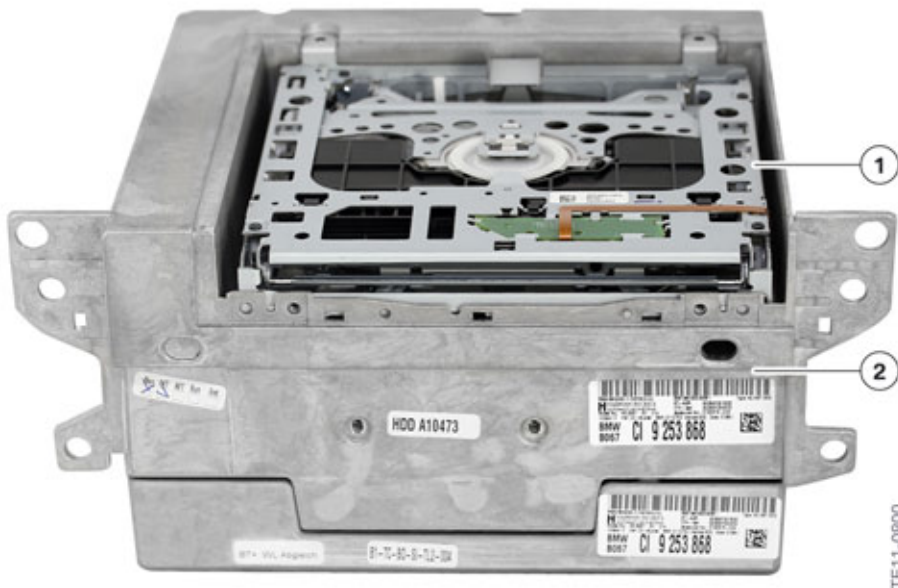
Front view of Headunit High with DVD drive

Index	Explanation
1	DVD drive
2	Housing of Headunit High

By combining several external control units in one housing the following advantages are possible:

- More functionalities
- Excellent software expendability through suitable interfaces
- epitomized installation area and less weight

The Headunit High has a modular design. The key systems for communication are integrated as modules within the Headunit.

Headunit High

4. System Components

The following components are incorporated in the HU-H housing:

- 3 x tuner (FM)
- 2 x tuner (AM)
- Frequency diversity module
- IBOC decoder (US only)
- SDARS satellite tuner (US only)
- Audio system controller
- MOST-CAN gateway
- Interface/Voltage supply CID (APIX)

DVD drive

The DVD drive can also play CDs (CD digital audio), this includes CD-ROM, CD-R and CD-RW.

The DVD audio for HiFi fans is considered a special case as only the video clip part can be played and not the multiple-channel audio part.

Although Blu-ray discs are **not** supported, DVD videos, DVD-ROM, DVD-R, DVD+R, DVD-RW, DVD+RW, DVD-R DL, DVD+R DL are.
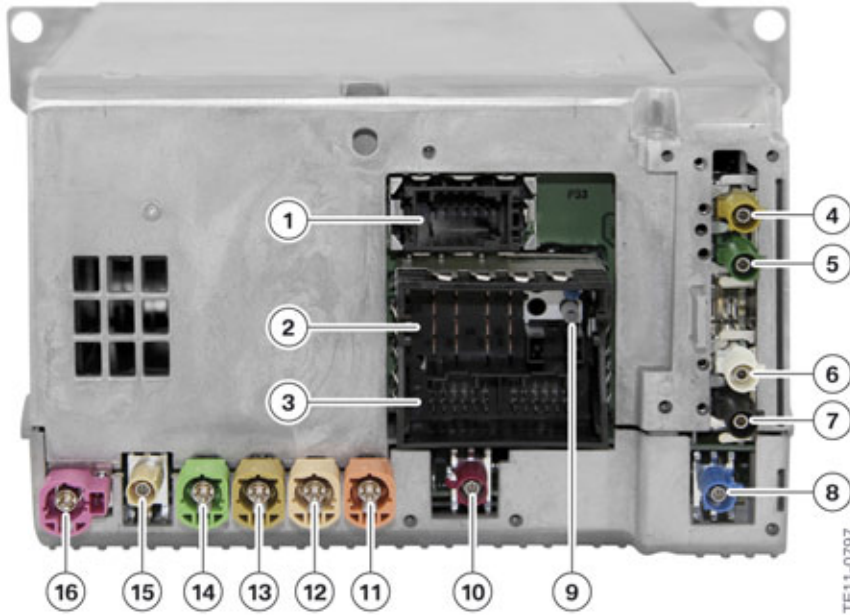
For compressed audio files like .mp3, .wma and also AAC (Advanced Audio Coding) formats (e.g. .m4a = iTunes®; .aac; .3gp; .mp4; .m4b) are supported.

4.1.3. Rear view of Headunit High

In comparison to the predecessor CIC (Car Information Computer) Headunit High the 3rd generation of the Headunit High has a variety of additional connections.

Headunit High

4. System Components

Rear view of the Headunit High with connections

Index	Explanation
1	FBAS 3 and 4 for additional video sources in the vehicle
2	NF for the speakers, telephone mute, K-CAN, voltage supply
3	Micro 1 and 2; Aux-In, FBAS 1 and 2
4	**Not for US**
5	**Not for US**
6	FM2, color code white
7	AM/FM1; color code black
8	GPS antenna, color code blue
9	Media Oriented System Transport (MOST) bus
10	Color code burgundy **(Not for US)**
11	Ethernet connection for RSE , color code orange
12	USB1 connection; customer access at AUX-In USB socket in the center console (also for data imports/exports); color code beige
13	USB2 connection; connection for customer Smartphone via telephone base plate; color code curry
14	USB3 connection; Telematic Communication Box (TCB) color code light green
15	Bluetooth antenna connection; color code beige
16	APIX connection and voltage supply of the central information display; color code violet

Headunit High

4. System Components

US version

In the US version connections the 4, 5 and 10 are not used. The digital radio HD together with the IBOC tuner is powered via the FM interface. For the satellite radio SDARS an antenna connection is provided in the top right area of the Headunit High.
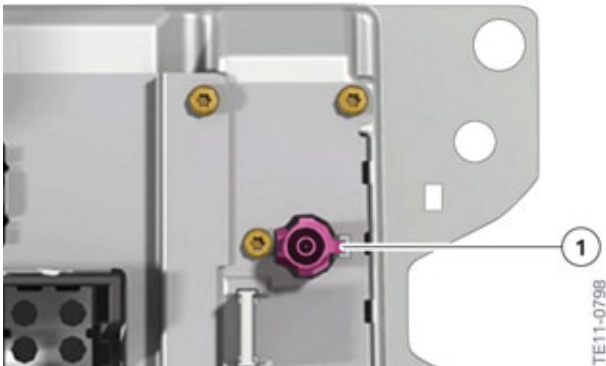
US version of Headunit High with SDARS connection

Index	Explanation
1	Connection for SDARS antenna

4.1.4. Hard disk

Hard disk in the Headunit High

Index	Explanation
1	Hard disk
2	Housing of Headunit High

Headunit High
4. System Components

Partitioning

The hard disk in the Car Information Computer had a storage capacity of 80 GB. This was increased to 200 GB in the 3rd generation of the Headunit High. While navigation and contact details and the Gracenote database have retained the standard capacity as in the CIC, other areas have been expanded. For example the memory capacity for the music collection was increased by more than 8 GB to 20.5 GB. The interactive Owner's Manual (IBA) was expanded from 0.5 GB to 4 GB. The speech input system "iSpeech" (voice recognition) was also increased from 0.5 GB to 1.7 GB. With a reserve of 100 GB the storage capacity is more than sufficient even after several updates to the navigation data.

Headunit High

4. System Components

iSpeech 1,7 GB
Contacts 0,5 GB
System 2 GB
CDDB (Gracenote) 5,1 GB

Navi 65,5 GB

Enter-
tainment
Server
20,5 GB

IBA 4 GB

Free space 100GB

TE11-0834
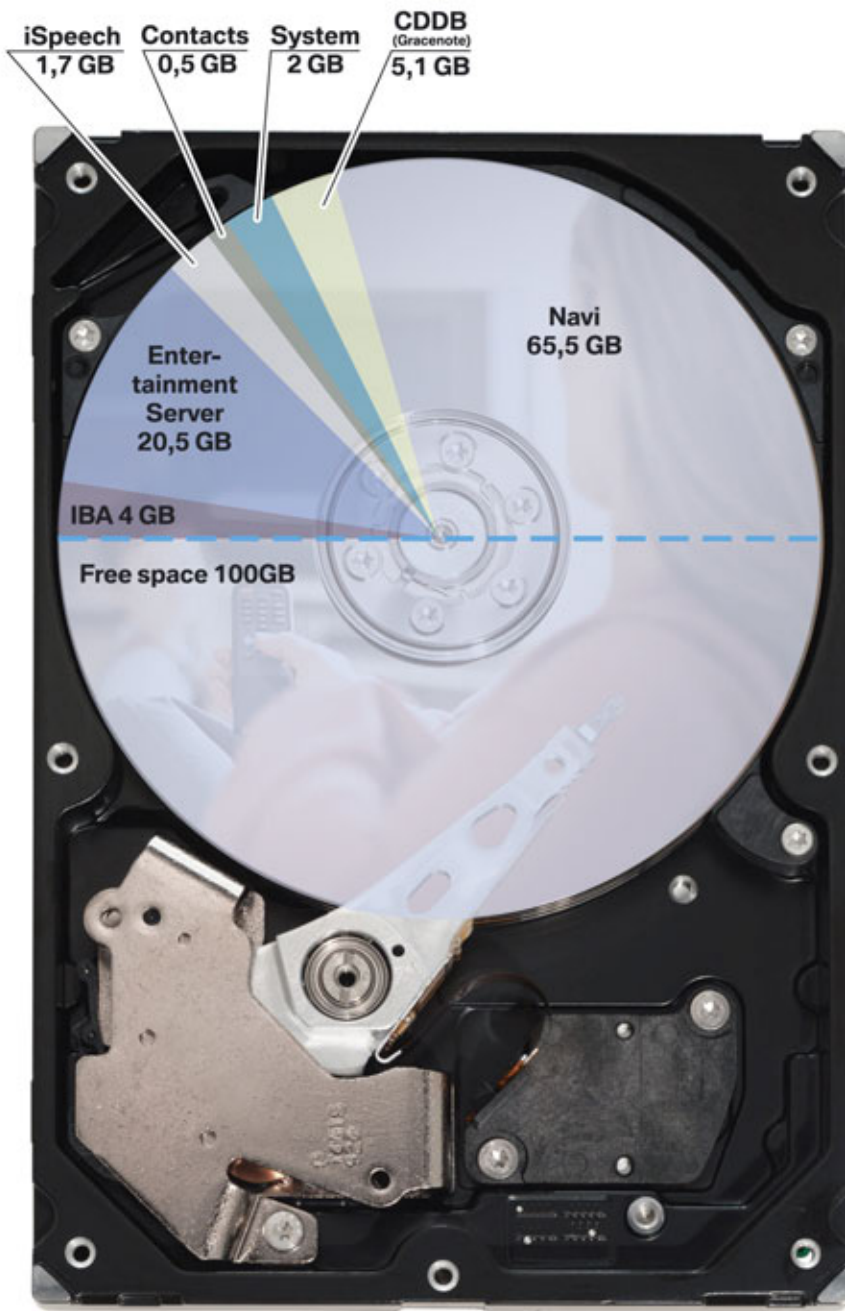
Partitioning of the hard disk in the Headunit High

Headunit High

4. System Components

4.1.5. Tuner modules

FM/AM tuner module
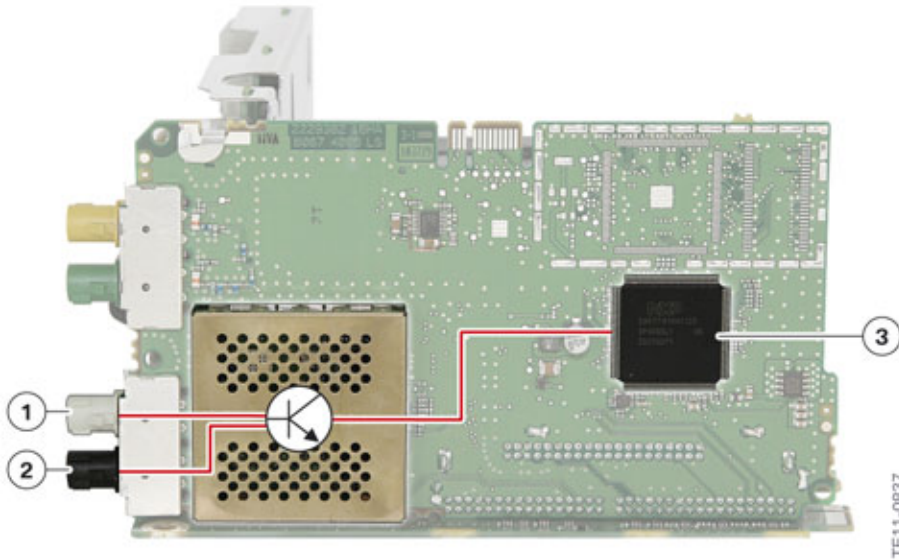
Phase diversity in the Headunit High

Index	Explanation
1	Connection 2nd FM antenna
2	Connection FM/AM antenna
3	FM/AM tuner module

Headunit High

4. System Components

Digital radio tuner module
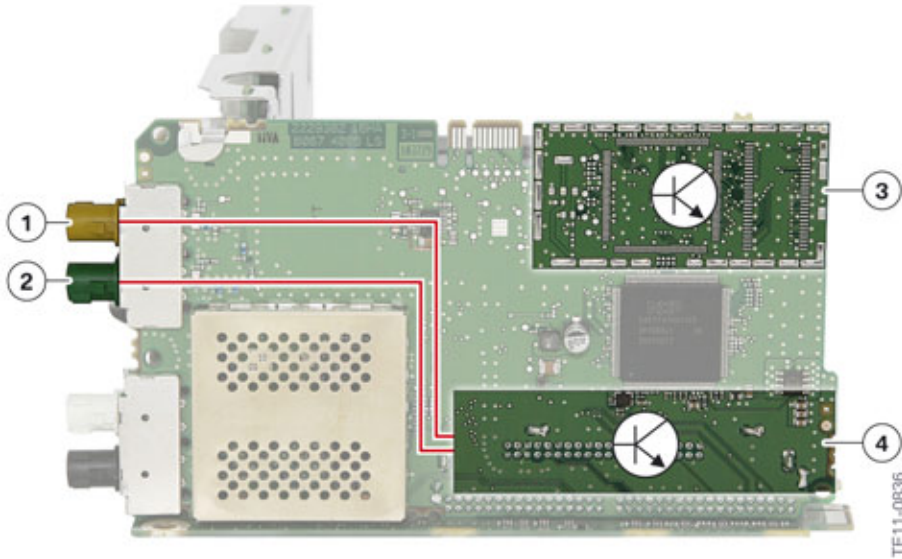
Digital radio tuner module

Index	Explanation
1	Connection DAB band 3 antenna **(Not for US)**
2	Connection DAB L band antenna **(Not for US)**
3	IBOC tuner module **(US only)**
4	DAB tuner module **(Not for US)**

Headunit High

4. System Components

4.1.6. System components

Main board
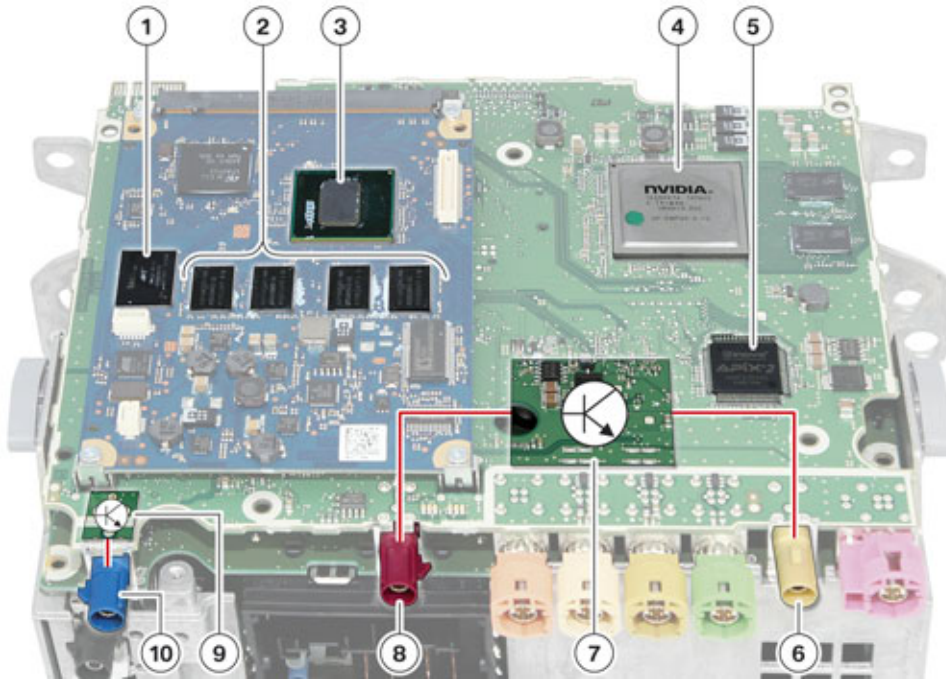
Main board of Headunit High

Index	Explanation
1	Flash memory NAND 8 GB
2	Working memory 1GB
3	Main processor
4	Graphic processor
5	APIX module
6	Connection for Bluetooth antenna
7	Radio module for Bluetooth antenna
8	Connection **(Not for US)**
9	Yaw rate and acceleration sensor
10	GPS antenna connection

Headunit High

4. System Components

Fan and power pack
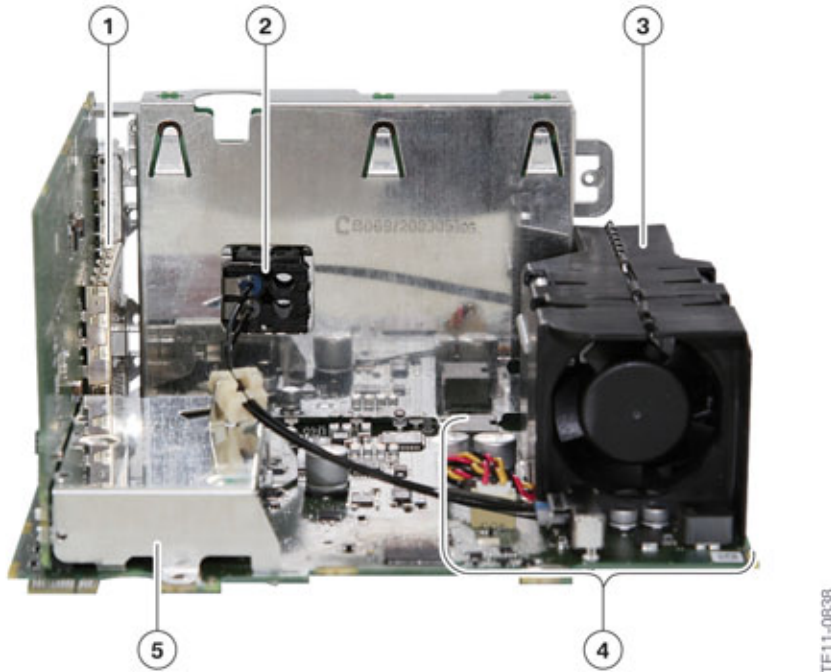
Main board with fan

Index	Explanation
1	FM/AM tuner module
2	MOST connection
3	Fan
4	Power pack / Power module
5	SDARS **(US only)**

4.1.7. Integrated flash memory

To protect sensitive customer data such as "Address details" and "Settings" for example, a permanently integrated flash memory was installed in the Headunit High. The data is much more protected against external influences here than on a hard disk. The integrated flash memory is permanently installed and **cannot** be individually replaced or updated.

Headunit High

4. System Components
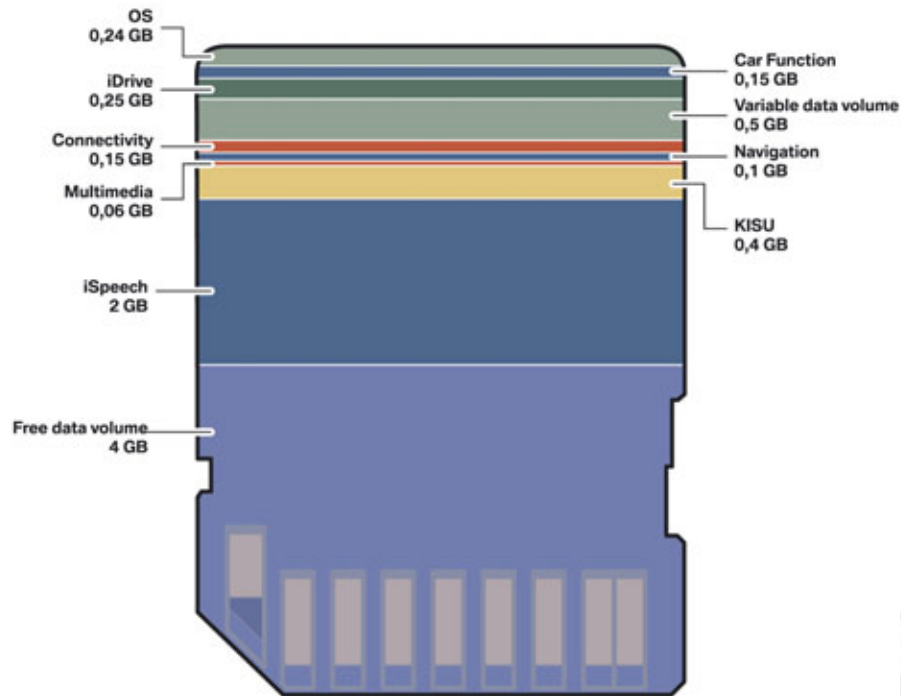
Division of installed flash memory; symbol shown as flash memory card

4.2. Displays and operating elements

4.2.1. APIX data line

APIX data line from Headunit High to CID

Headunit High

4. System Components

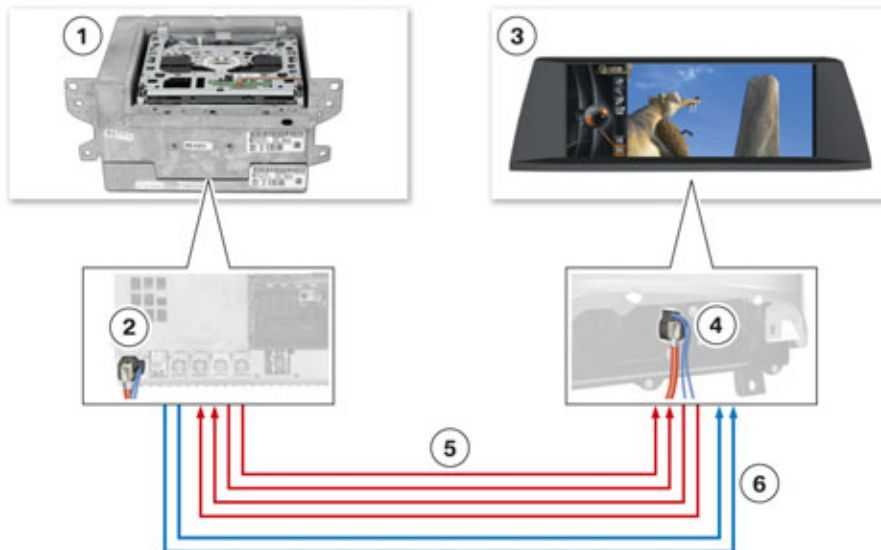| Index	Explanation
1	Headunit High
2	Connection for output of video signal APIX at Headunit High
3	Central information display (CID)
4	Connection for input of video signal APIX central information display (CID)
5	APIX data connection lines
6	Power supply for CID via Headunit High

The central information display (CID) has no separate bus connection in conjunction with the Headunit High. The CID is directly connected to the headunit via an APIX data line. APIX (Automotive Pixel Link) is a bit-serial data transfer system with a data transfer rate of 1 Gbit/s on just one copper core pair. Each APIX data channel also has a **bidirectional reverse channel**. This reverse channel is used for transmitting status information (e.g. operating temperature of the CID), diagnosis information and control signals.

Data transfer via the APIX data line has been optimized with regard to electromagnetic compatibility and power consumption. Because of the CID's low power consumption, the **CID can be supplied with power** via two separate current lines directly by the Headunit High, and there is no need for a separate power supply to the CID. The two copper core pairs and the two power supply leads are connected by a common connector to the headunit and the CID. Because of the high data transfer rate with low electromagnetic emissions, it is also possible to use copper wiring for applications with a high bandwidth requirement and to dispense with fiber optic networking.

4.3. External devices

4.3.1. AUX-IN connection with USB interface

With the use of the Headunit High, the USB interface **in the glove box** is **discontinued**.

Otherwise, the Headunit High USB audio/video interface and customer data import/export is always housed at the **center console**.

There will thus only be **one** USB interface in the vehicle, available in the switchable versions (for vehicles with USB base plate) or non-switchable for vehicles without USB base plate. This connection is then used both to play external media and for data import/export such as navigation data for example.

Video files

With the new Headunit High for the first time it is possible to send video files using a memory medium (USB stick) to the headunit and play them there. Video and audio files are combined here in the container and sent as a digital signal via USB.

A container file or a container is a file in digital data processing which can contain different files and file types. For details see Chapter 1.4. Some formats also allow embedding of subtitles, menu structures or other content, etc.

The following **video files** are supported:

Headunit High

4. System Components

Group	Abbreviation
Video files (Codecs)	MPEG-1, MPEG-2, MPEG-4/2 ASP (XVid, DivX5), MPEG-4/10 AVC (H.264), VC-1 (WMV), MS-MPEG4 (DivX3), Theora
Audio files (Audio Codecs)	MPEG–4/3 (aac), MPEG-1 (mp2, mp3, mp3pro), Dolby Digital (ac3), WMA, FLAC, ADPCM, LPCM
Container	MPEG-4 (.mp4, .m4a, .m4v, .m4b), Quicktime (.mov), Matroska (.mkv), .wmv, .mpeg, .asf, .avi, .wav

The following **video files** are **Not** supported:

Group	Abbreviation
Real media	.rm and .ra
Flash video	.flv
Quicktime	.mov with **old** Sorenson Codecs (1998–2002)
DVD formats	.vob and .ts container
Ogg	.ogg/.ogm/.ogv
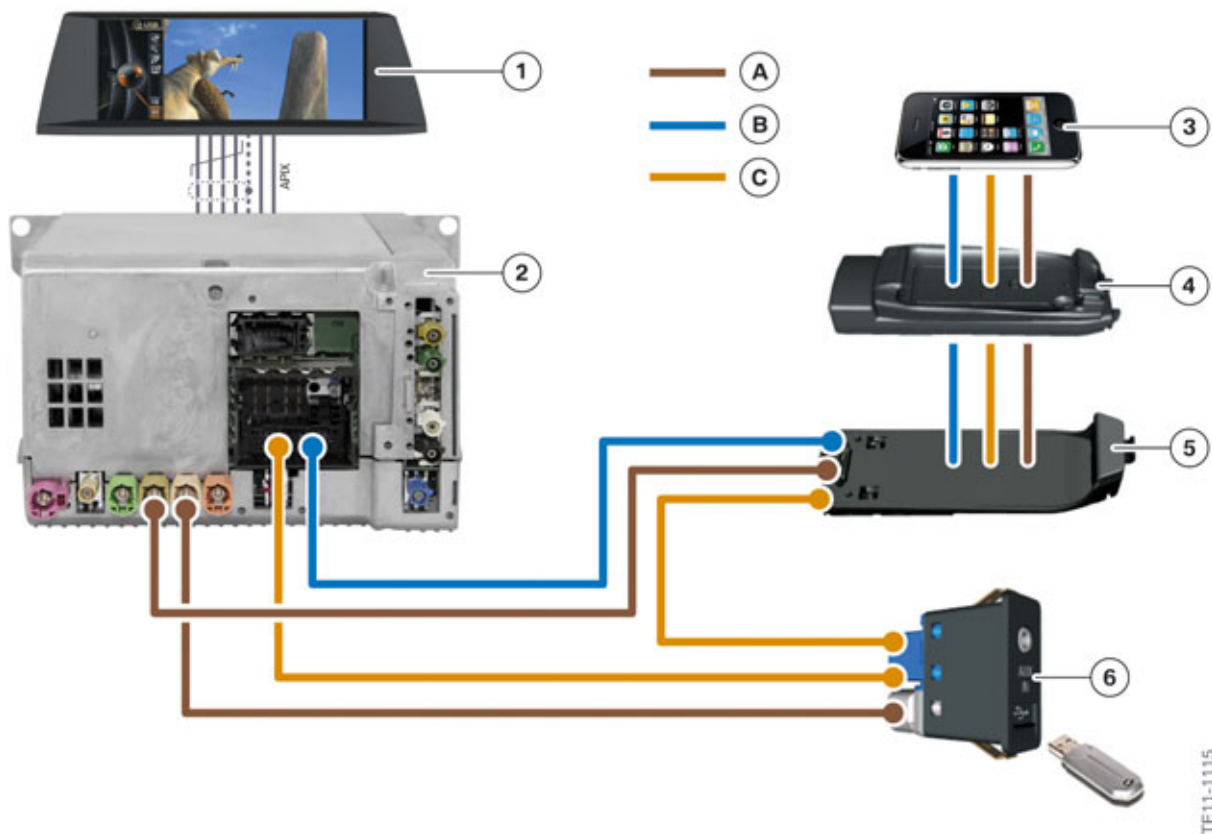
Function plan for media interfaces

Headunit High

4. System Components

Index	Explanation
A	USB signal
B	Video signal
C	Audio signal
1	Central information display (CID)
2	Headunit High (HU-H)
3	External player (Smartphone iPhone)
4	Snap-in adapter
5	Video base plate
6	AUX-IN connection with USB interface

4.3.2. Smartphone connection

If the SA6NL is selected as telephone optional equipment, the **connected SA6NF "Media interface for Smartphones"** for BMW vehicles is generally installed with a video base plate. The vehicles are thus prepared for videos. Only the CVBS line to the headunit and the corresponding software are missing.

CVBS line and software can also be ordered by the customer with the SA6NR "Apps". In addition to the USB connection of applications for the Smartphone (Apps), a video interface and the iPod remote control function, called "plug-in" is also installed in the vehicle (under the ConnectedDrive menu).

4.4. Telephone systems

For the telephone systems of the Headunit High the optional equipment SA6NH — Hands-free Bluetooth and USB audio connection and the SA6NL Bluetooth and USB devices with BMW Assist are used.
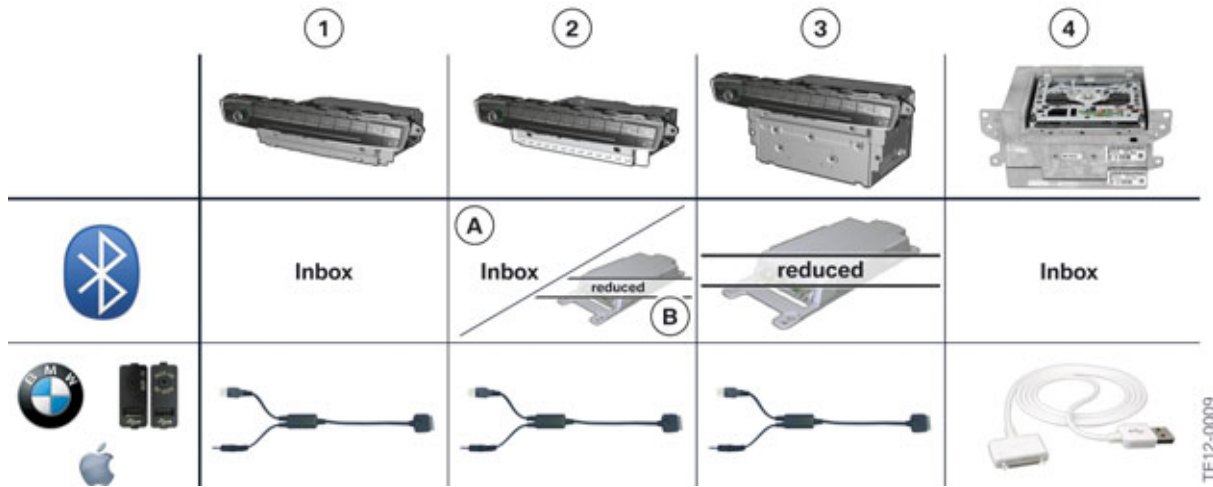
4.4.1. Telephone-supported headunit

With the introduction of the Headunit High it is now also possible to support the "telephone-supported headunit" (Inbox). This is available as standard in the BMW 5-Series, 6-Series and 7-Series, X5 and X6. This function is also activated in BMW 1-Series, 3-Series and X3 (F25) vehicles with the order of a Headunit High (SA609 navigation), as SA6NH – **hands-free system with USB interface** is included automatically.

The SA6NH Hands-free Bluetooth and USB audio connection includes a basic hands-free system (without cell phone charger base plate) and without external antenna. i.e. For the customer this means simple implementation of a hands-free system through a Bluetooth connection for cell phone and vehicle.

Subsequent comparison of the SA6NH versions with Headunit Basic, CIC Basic 2, CIC and Headunit High. Installation of the slim-design version of the telephone control unit Combox Media with reduced range of functions as an interface is no longer required for the Headunit High. This is made possible through an antenna output for the Bluetooth antenna, as well as an integrated module for the Bluetooth connection with the customer cell phone.

Headunit High

4. System Components

Comparison of headunits with headunit-supported telephone across all models

Index	Explanation
1	Basic headunit
2	Car Information Computer Basic 1 and 2
3	Car Information Computer (CIC)
4	Headunit High
A	Headunit-supported telephone (Inbox) for Car Information Computer Basic 2 (CHAMP2)
B	Combox with reduced range of functions for Car Information Computer Basic 1 (CIC MID)

For the Headunit High in conjunction with the SA6NH for Apple$^®$media player (iPod$^®$, iPod Touch$^®$, iPhone$^®$) no Y-cable can be used. The so-called "One-Wire technology" in conjunction with the white standard Apple$^®$ USB cable is required here to connect the Apple$^®$ media player to the vehicle via the USB interface in the center console. The former Combox features: Bluetooth audio streaming, Office, album cover and software update continue to remain deactivated for SA6NH. The customer needs to order SA6NL for this.

⚠️

It is important to note that "not all hardware configurations are available in all markets" and that available options way vary within the different BMW model series vehicles.

4.4.2. Telephone connection with snap-in adapter

Option **SA6NK connection for Bluetooth and USB devices** is offered in many markets as a further expansion stage to the SA6NH. In addition to a hands-free system, a base plate for a snap-in adapter is also installed. This base plate has a charger for the cell phone and a connection for the external antenna.

Headunit High
4. System Components

The following functions are also available:

- Bluetooth audio streaming
- Office functions with calendar, reminders, notes
- Album cover for audio files

The functions are moved to the headunit with the 3rd generation Headunit High and the additional use of Combox multimedia (Media) is no longer required.

4.4.3. Telematic Communication Box (TCB)

The **Telematic Communication Box (TCB)** is a permanently installed speech and data modem for the Headunit High. The transmission standard of the TCB is specified in the **HSPA standard with 14.4 mbit/s**. The customer receives a TCB when the **SA6NL connection for Bluetooth and USB devices with BMW Assist** is ordered. As most interfaces and functions of Combox are moved to the Headunit High (hands-free function, USB interfaces, speech processing, Bluetooth audio, Office, contacts etc.).

The TCB is required for the following functions:

- BMW Assist with eCall (emergency-call function)
- BMW Online
- Remote functions (reception and controller)
- "Speech-to-Text" function in Office feature
- BMW TeleServices via P-SIM

The TCB is always connected to two cell phone antennas. The roof antenna is for the telematics functions of the vehicle. The second antenna should function as an emergency-call antenna in the event of a rollover. The emergency-call function involves sending the data package, as well as setting up a voice contact from the vehicle to the emergency call center.

The TCB is prepared and equipped with an additional battery pack in order to guarantee functions independent of the vehicle electrical system. Thus in the future even in the event of an accident with a loss of the vehicle electrical system (destruction of battery, power distribution box or wiring) an emergency call can still be placed.

Headunit High

4. System Components
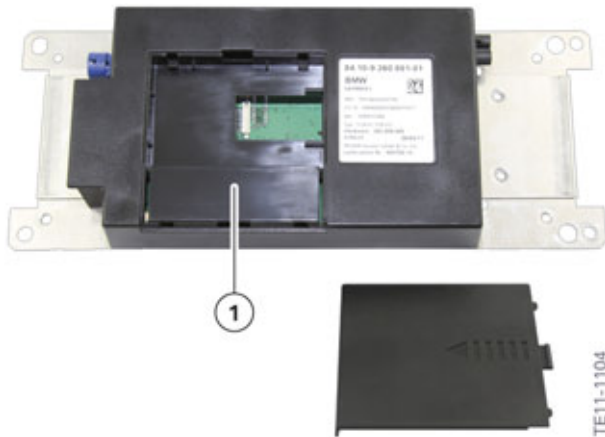
Telematic Communication Box (TCB)

Index	Explanation
1	Compartment for battery unit

Overview of the telephone systems

	SA6NH	SA6NL
Optional equipment code (old)		SA639
Marketing designation	Hands-free system with USB interface	Connection for Bluetooth and USB devices incl. BMW Assist
Max. number of connected cell phones	1	2
Former SA6FL (USB interface)	Included	Included
SA6NF (Smartphone connection)	Not available	Optional equipment
SA6NR (Apps)	Not available	Optional equipment
SA620 (speech input system)	Not available	Standard equipment in conjunction with SA249 multifunction steering wheel
Address book via Bluetooth connection	Menu for Telephone/Contacts or Office/Contacts	Menu for Telephone/Contacts or Office/Contacts
Telematics services	C-SIM (customer telephone) BMW TeleServices, BMW Live	P-SIM (permanently installed SIM in TCB) BMW Online, E-Call, remote service, BMW Assist and BMW TeleServices
Bluetooth audio streaming	Not available	Included in the "External devices" menu
Office functions	Not available	Included in the "Office" menu

Hardware components

Headunit High

4. System Components

Bluetooth antenna available	Yes	Yes
Microphone(s)	1	2
External antenna for telephone and telematics	Not available	2
Emergency call antenna for eCall	Not available	1
Video base plate (Smartphone connection + preparation of Apps)	Not available	Video base plate with SA6NF

Front view of TCB
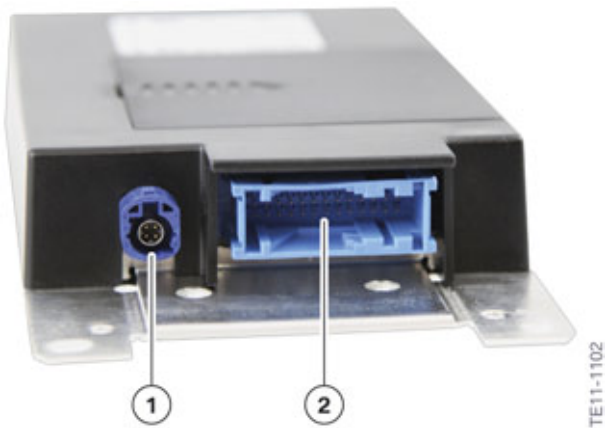
Front view of Telematic Communication Box (TCB)

Index	Explanation
1	USB port as data bus interface for the HU-H
2	Main plug for K-CAN2, voltage supply, microphones

Headunit High

4. System Components

Rear view of TCB

Rear view of Telematic Communication Box (TCB)

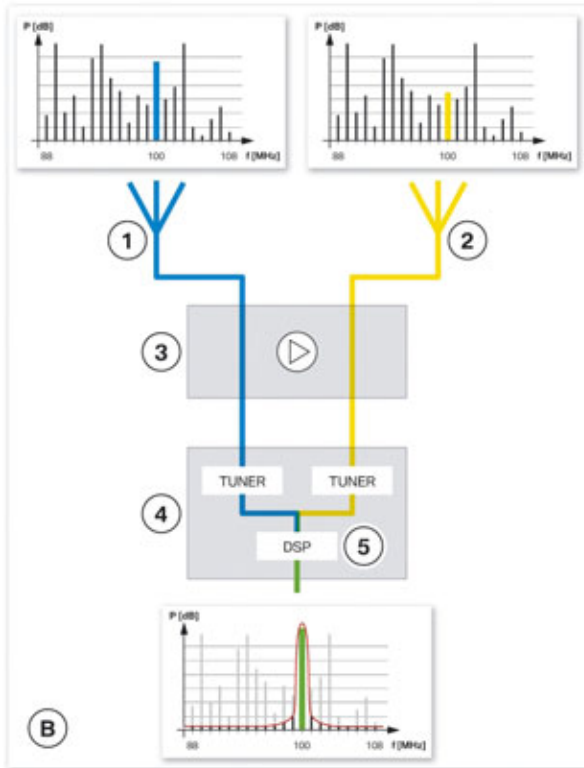| Index	Explanation
1	Connection for telematic antenna
2	Connection for emergency-call antenna (eCall)

The connection for the telematic antenna is connected to the roof antenna. For details please refer to the system wiring diagrams in Chapter 3.2.2.

Headunit High

4. System Components

4.5. Antenna systems

4.5.1. Phase diversity for FM

Operating principle of phase diversity

Index	Explanation
B	Phase diversity
1	Antenna signal strong
2	Antenna signal weak
3	Antenna amplifier (2x)
4	Tuner module in headunit
5	Digital Signal Processor (DSP)

Vehicles with Headunit High are equipped with phase diversity. The radio signals of the two FM antennas are amplified and transmitted to the Headunit High. The power supply for the antenna amplifier is made available by the Headunit High. The radio signals are digitized in the Headunit High. An improved signal is then calculated from the two radio signals with the aid of an algorithm in a digital signal processor (DSP). For updating the list of stations only the signal of one antenna is used temporarily for the radio reception. The signal of the two antennas is required for scanning the frequencies. The interval for updating the list of stations depends on the signal quality of the stronger antenna, but occurs at the latest every four minutes.

Headunit High
4. System Components

4.5.2. Intermediate frequency in the AM range

For the AM range there is a variable ZF bandwidth in the Headunit High which is dependent on the reception strength. The usual bandwidth of approx. 7 kHz is restricted for a weak signal to 2.4 kHz. The resulting effect is comparable to turning back the treble control.

The reduction of the high frequencies was previously done via the so-called High Cut. Here a frequency reduction is only performed on the audio side. With the variable AM-ZF bandwidth one achieves a comparable acoustic effect, but at the same time a significant improvement in the channel separation.

An "interfering transmitter" which can be received on a neighboring channel is better suppressed to 30 dB (factor 30). On AM this is important at nighttime.

4.5.3. Bluetooth antenna

Since the introduction of the 5-Series Gran Turismo the Bluetooth antenna was incorporated into the wiring harness. With this design a disconnected antenna can no longer be identified by diagnosis. With the use of the Headunit High diagnosis-compatible antennas are now once again used for BMW vehicles. Here the connector is resistance-coded, i.e. a disconnected antenna is immediately recognized by the diagnosis system. For large series vehicles the Bluetooth antenna is located in the rear of the center console (branch rear outlet channel, rear left).

4.5.4. SDARS and IBOC (US)

For the US market SDARS or the digital radio IBOC tuner module are located **in** the tuner module for the satellite radio inside the Headunit High. This was already the case with the introduction of the Car Information Computer (CIC). More information on the connections for SDARS and IBOC is available in Chapter 4.1.3.

The SDARS antenna is integrated in the roof antenna. The IBOC HD radio system uses the side bands of the FM frequency band and thus the FM antenna. In this connection, phase diversity in the FM range has a positive influence on the reception of digital HD radio signals.

4.6. Rear seat entertainment system

4.6.1. System overview

Two rear seat entertainment systems with a separate RSE control unit are offered in conjunction with the Headunit High for 5-Series, 6-Series Gran Coupe and 7-Series vehicles. A distinction is made here between the **rear seat entertainment system SA6FH** (high version with radio remote control) and **Rear-seat entertainment Professional SA6FR** (high version with controller). For vehicles in the 5-Series the Rear-seat entertainment Professional version is not offered with a controller (SA6FR).

Headunit High

4. System Components

Rear seat entertainment system (SA6FH)

Index	Explanation
1	CID
2	Headunit High
3	Right rear monitor
4	RSE remote control
5	Rear entertainment control unit (RSE)
6	Left rear monitor

Headunit High

4. System Components

Rear seat entertainment system Professional with iDrive control (SA6FR)

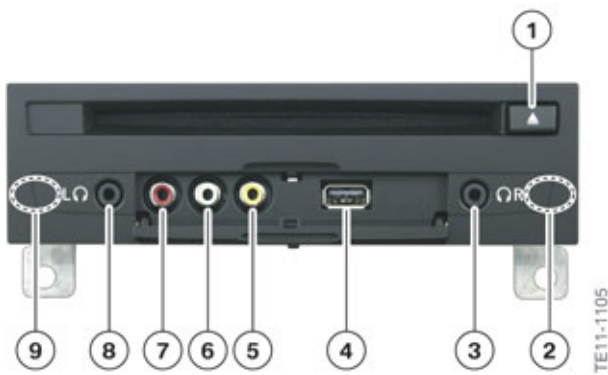| Index	Explanation
1	CID
2	Headunit High
3	Right rear monitor
4	RSE rear controller
5	Rear entertainment control unit (RSE)
6	Left rear monitor

4.6.2. Front view of RSE control unit

The big addition to RSE would be the ability to use Navigation and set destinations from the rear seat. Another new feature in comparison to the rear seat entertainment system introduced in the F01 is the **RSE control unit** with USB interface in the front. In comparison to the predecessor RSE control unit, the second AUX In input (audio right and left, video) is discontinued. The new RSE control unit includes two radio interfaces for the connection of two wireless headphones. These replace the infrared system of the previous RSE system. The same RSE control unit is used for the two rear seat entertainment system versions.

Headunit High
4. System Components

The CD/DVD drive supports a variety of media just like its predecessor (for details see F01/F02 rear seat entertainment systems training material available on TIS and ICP). The Gracenote® database function is active when playing CD digital audio in the RSE control unit drive as well as when playing in via the Headunit High drive. However, due to space restrictions no album cover is displayed when playing. This is reserved exclusively for the Headunit High and the central information display at the front of the vehicle.

Track information and album covers of CD digital audio files from the DVD changer are not shown in the rear seat entertainment system. The reason for this is that the rear seat entertainment system does not request information from the Gracenote® database in the Headunit High when playing music files from the DVD changer.

Front view of rear seat entertainment system control unit (RSE)

Index	Explanation
1	Eject button for the CD/DVD compartment
2	Radio interface for the right headphone (not visible from outside)
3	Jack socket for the right headphone
4	USB port, rear passenger compartment
5	Input for video signal, external source
6	Input for audio signal, external source, right
7	Input for audio signal, external source, left
8	Jack socket for the left headphone
9	Radio interface for the left headphone (not visible from outside)

Headunit High

4. System Components

4.6.3. Rear view of RSE
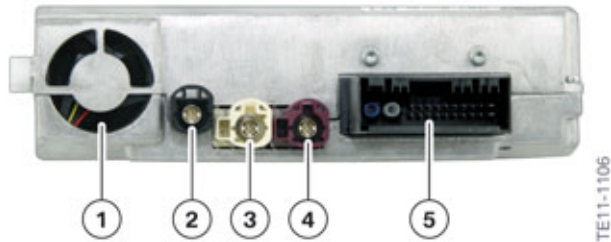
Rear view of RSE control unit

Index	Explanation
1	Fan unit
2	Ethernet connection for connection to HU-H
3	Video connection, rear monitor, right, voltage supply display
4	Video connection, rear monitor, left, voltage supply display
5	Main connector for voltage supply, CVBS signal for video switch, MOST

Headunit High

4. System Components

4.6.4. Front view of FD

For the rear monitor (FD) of the rear seat entertainment system of the F01 LCI a completely new TFT display screen was redesigned with new features. A 9.2" display screen with a resolution of 800 x 480 pixels is provided. Similar to the CID in the front the rear monitor is also connected directly to the RSE control unit via APIX.

The display screen can be switched on and off using a ON/OFF button on the screen or using the controller/remote key of the rear seat entertainment system. As the connection via infrared to the headphones is discontinued, the bar with infrared LEDs on the screen could be omitted.
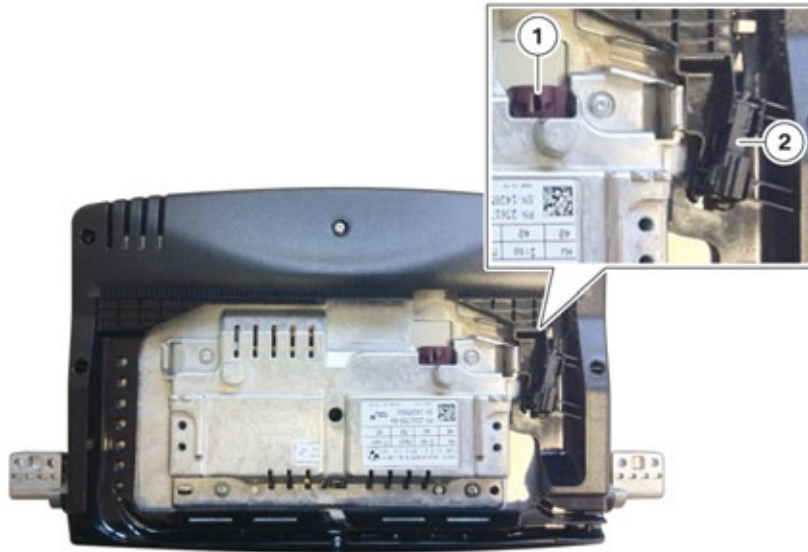

Rear monitor of the 7-Series LCI

Index	Explanation
1	ON/OFF button on display screen

Headunit High

4. System Components

4.6.5. Rear view of FD

Rear view of the rear monitor of the 7-Series LCI

Index	Explanation
1	APIX connection for RSE control unit for the rear monitor incl. voltage supply
2	3-terminal ELO connector with ground, Kl.58g and signal line from controller button

Headunit High
4. System Components

4.6.6. Rear seat entertainment system SA6FH
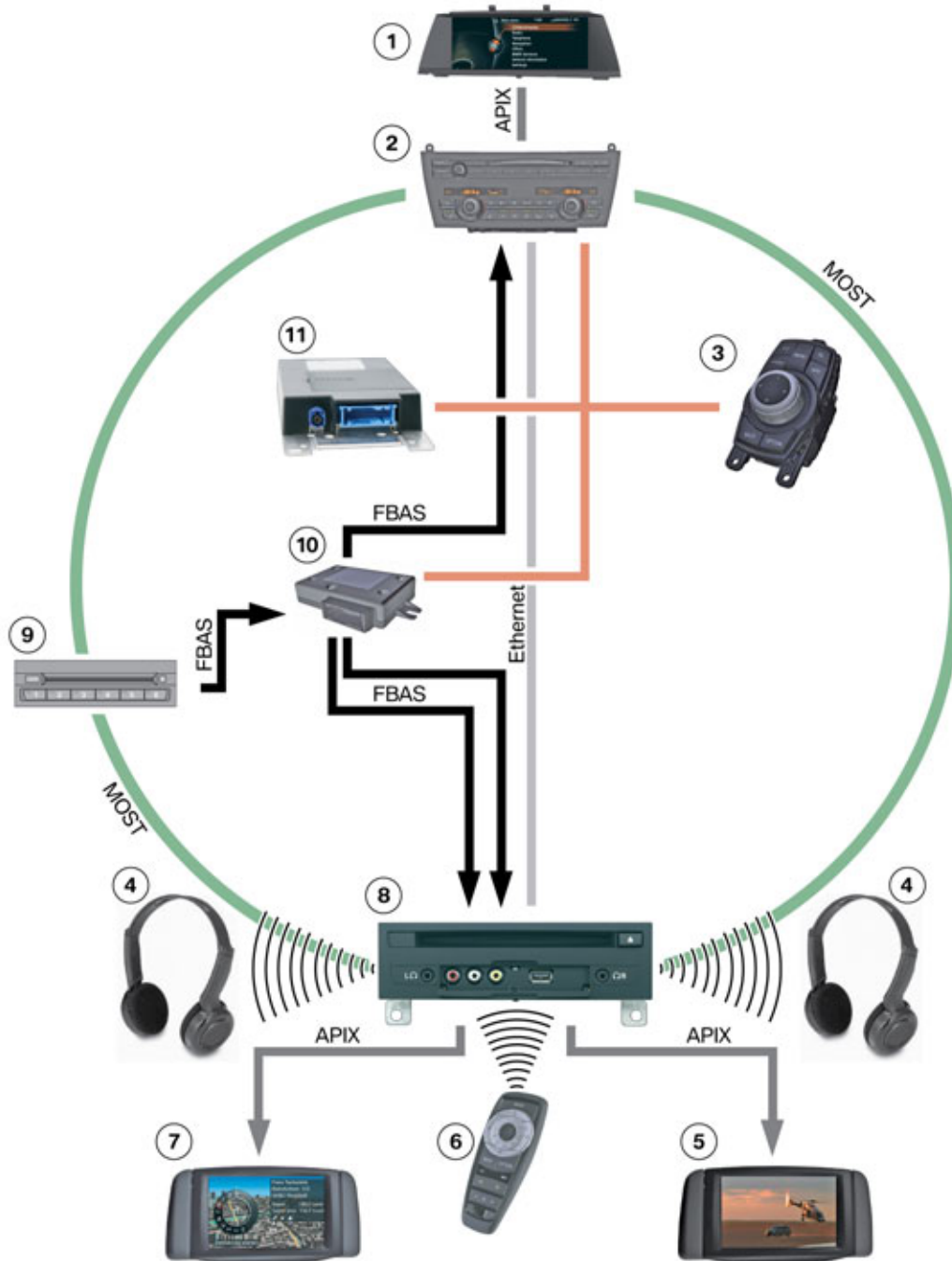
Function profile of rear seat entertainment system SA6FH

Headunit High
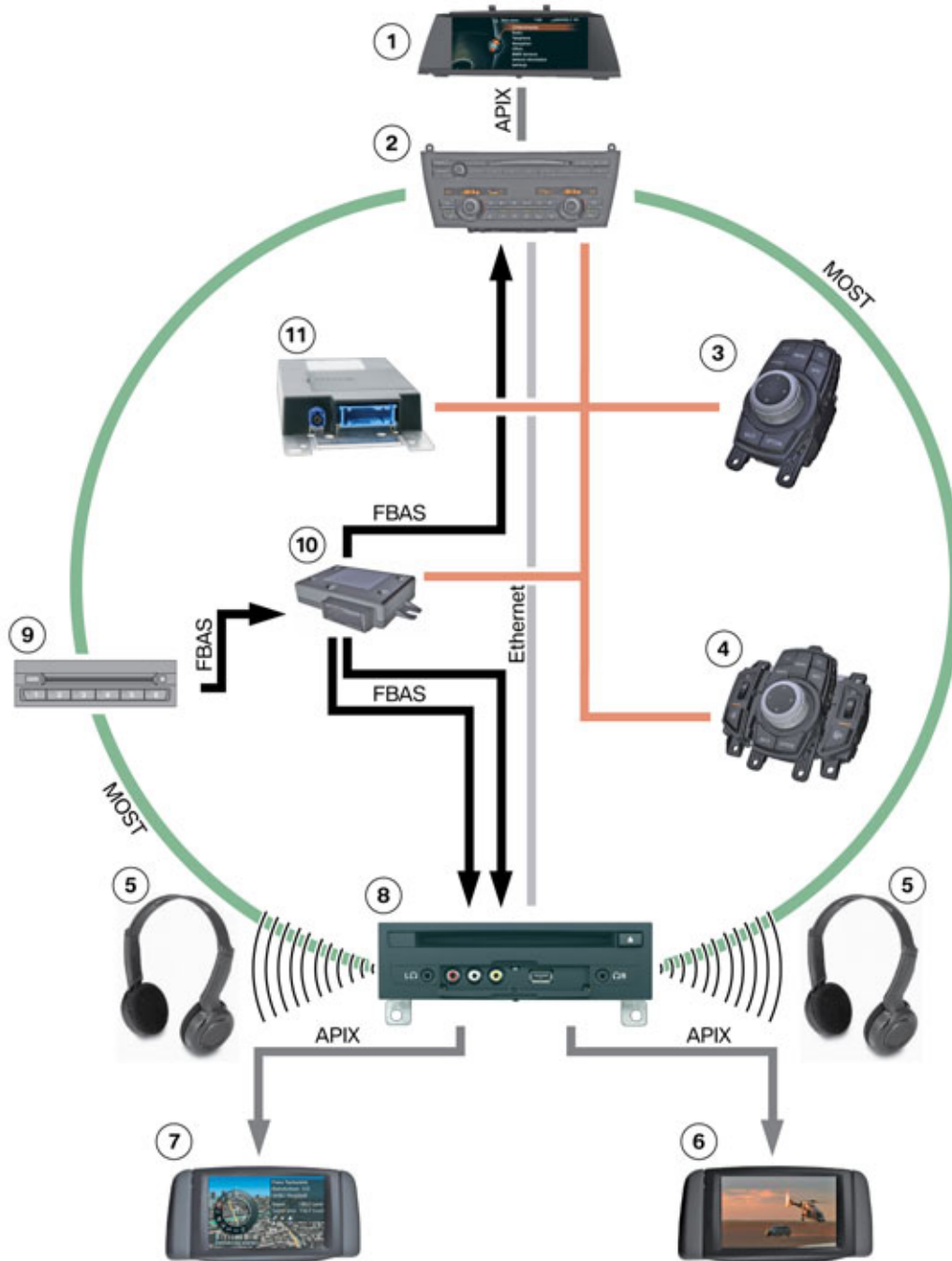
4. System Components

Index	Explanation
1	Central information display (CID)
2	Headunit High (HU-H)
3	Controller (CON)
4	Headphones with radio connection (Kleer technology)
5	Rear monitor, right (current display video)
6	Remote operation (transmission path via FBD)
7	Rear monitor, left (current display navigation)
8	RSE control unit
9	CD changer (CDW)
10	Video switch (VSW)
11	Telematic Communication Box (TCB)

Headunit High

4. System Components

4.6.7. Professional rear entertainment SA6FR

Function profile of rear seat entertainment system Professional with iDrive control (SA6FR)

Headunit High

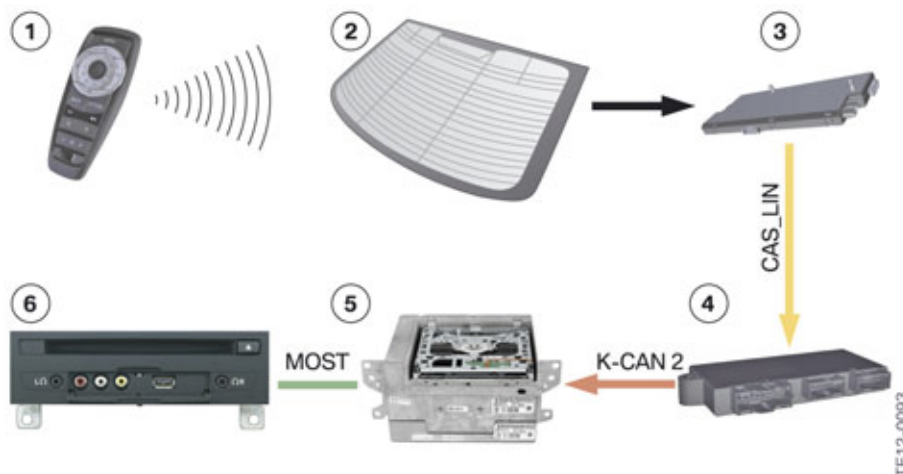## 4. System Components

Index	Explanation
1	Central information display (CID)
2	Headunit High (HU-H)
3	Controller (CON)
4	Rear-compartment controller (FCON)
5	Headphones with radio connection (Kleer technology)
6	Rear monitor, right (current display video)
7	Rear monitor, left (current display navigation)
8	RSE control unit
9	CD changer (CDW)
10	Video switch (VSW)
11	Telematic Communication Box (TCB)

4.7. Radio systems

4.7.1. Radio remote control

The radio remote control of the rear seat entertainment system sends the signals along a transmission path via the remote control receiver FBD to the vehicle. For vehicles in the 5-Series and 7-Series this is done via the FBD receiver in the rear window. In the new 3-Series and 6-Series vehicles the FBM receiver is installed as a module near the left C-pillar. The other signal shape agrees with the vehicles in the 5-Series and 7-Series.

Function profile of remote control services (FBD)

Headunit High

4. System Components

Index	Explanation
1	Remote control
2	Rear window
3	Antenna amplifier with antenna diversity module
4	Car Access System (CAS)
5	Headunit High (HU-H)
6	Rear Seat Entertainment (RSE)

4.7.2. Wireless headphones

Headphones for the radio transmission

The headphones for the previous system used infrared technology, this has now been changed over to radio transmission. With the radio transmission via Kleer protocol a high-end radio transmission in the range of 2.4 GHz was selected, which supports 14 channels. In contrast to traditional Bluetooth protocols, the Kleer protocol ensures uncompromised (loss-free) sound reproduction on the headphones. For details see Chapter 5.8.3. The voltage supply is guaranteed via three typical AAA batteries.

Headunit High

4. System Components

Setting options on wireless headphones

Index	Explanation
1	ON/OFF button with LED for ON/OFF and connection
2	Channel selection, can be changed by switching the button left or right
3	Knurled wheel for volume setting

Headunit High

5. Functions

The "Functions" module presents new features of the 3rd generation Headunit High in comparison to the 2nd generation Headunit High (Car Information Computer). A full description of the functions can be found in the Owner's Manual of the respective vehicle.

5.1. Display and operating concept

5.1.1. Changes to the predecessor

The display and operating concept of the new 3rd generation Headunit High includes a significant further development of the 2nd generation Headunit High (CIC). The menu structure in main menus and submenus was retained for the most part whereby many functions of the option menus have moved directly to the submenu. The digital graphics were enhanced significantly with 3D effect logos and the "opening" of individual menus.

Main menu of Headunit High

5.2. Multimedia

5.2.1. Multimedia submenus

Menu for Multimedia with submenus

Headunit High

5. Functions

Index	Explanation
1	CD/DVD
2	Music collection
3	External devices
4	Rear
5	Tone

5.2.2. Music collection

Saving media

The music collection on the hard disk was increased from 12.5 GB to 20.5 GB. The customer now has the option of saving approx. 5,700 music items instead of 3,500 music items in the form of a aac music files (rip function) with a bit rate of 192 kbit/sec.

If the customer plays the music collection as a backup on a USB stick, the music files are encrypted, .aac file thus cannot be found.

Saving a CD audio in the music collection

It is also possible to import music files from a USB stick. For this a USB stick is inserted in the import/export USB interface of the vehicle (for details see Media interfaces in Chapter 4.3.1). Then the process can be started in the option menu of the vehicle.

Via file import, copied music files from a USB stick or CD are placed one by one as .mp3, .wma or .aac in the same file format on the hard disk.

Headunit High

5. Functions

Music data import of USB stick

After the import of CD digital audio (original CDs), CDs with individually compiled content (e.g. .mp3 files) and USB stick content, the music collection looks as follows:

Music collection put together from several different media

Index	Explanation
1	Original CD digital audio, which was not recognized via Gracenote® database and also does not contain CD text
2	Several original CD digital audio; metadata supplemented with the Gracenote® database
3	CD-R, DVD-R with compressed audio files whose content (.mp3) was copied one by one onto the hard disk; track information was manually added via the option menu
4	USB stick content imported and copied onto the hard disk. Track information not yet added here

The music collection can now (for the first time) be partially deleted or cleaned. For this the menu "Manage music collection" is offered in the option menu.

Headunit High

5. Functions

Gracenote®

The Gracenote® database on the hard disk, which adds meta files to the music files, was divided up according to country for the Headunit High. There are therefore the following regional databases on the hard disk:

- Europe
- Rest of the World
- North America
- Japan
- China/Korea

Thanks to this regional division it was possible to establish further features. The Gracenote® database now adds track information and album covers when playing CD digital audio. During the import process (ripping) i.e. the changeover of a CD digital audio to a compressed .aac music file, in addition to track information, **album covers** are now added by Gracenote® to the music collection.

Update for Gracenote®

The latest Gracenote® database is made available to the dealer organization 1-2 times a year with the media package. The update process remains the same in comparison to the CIC. It is done via the service menu. For details on this please refer to the " F01/F02 Audio Systems" training material available on TIS and ICP. The update is also possible via the BMW programming system because the Gracenote® database was updated on the ISIS.

Operation

To make the menu items clearer for the customer the symbols have been standardized. This means the same symbols are always used, no matter whether one is in the menu "External audio sources" or "Music collection".
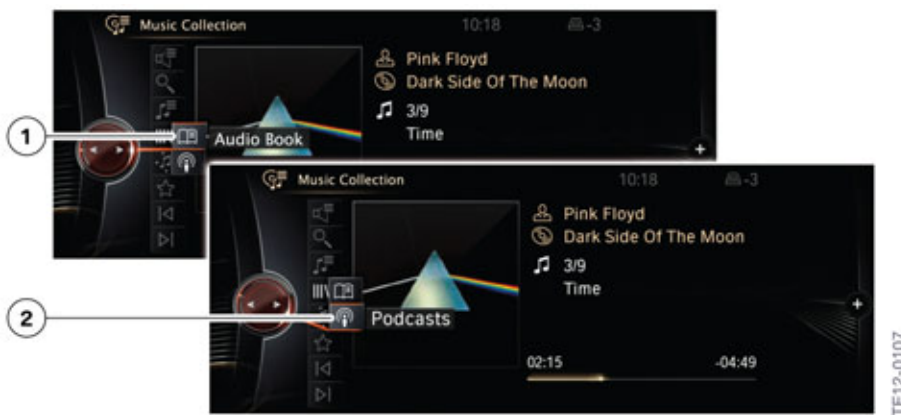

Music file in the music collection

Headunit High

5. Functions

Index	Explanation
1	Current playback
2	Music search
3	Playback lists
4	More media
5	Similar music (local)
6	Add to favorites; Remove from favorites
7	Previous track
8	Next track

Audio books and podcasts

Audio books and podcasts are recognized during saving to the music collection by their meta files and can be called up separately.

Audio books and podcasts in the music collection

Index	Explanation
1	Audio books saved in the music collection
2	Podcasts saved in the music collection

Favorites

The function to be able to save favorites in the music collection is new. For this the asterisk symbol "Add to favorites" must be pressed when the track is being played. These can then be found under the menu item playback lists (Symbol Note with dashes). Individual tracks can be deleted again or the favorites saved as playback lists.

Headunit High
5. Functions

5.2.3. External devices

Multimedia menu: External devices

The Headunit High in the audio and video area also functions as a **audio and video player** by means of external sources, in addition to playback of broadcasting sources (radio) and the music collection stored on the hard drive. On the one hand via wired connection from a Smartphone or USB stick. On the other hand by means of streaming sources such as Bluetooth.

USB stick

USB storage media as external audio players have been supported since the ULF-SBX-High (E70). The connection for the interface for the Headunit High is now no longer connected via a separate interface box (ULF-SBX High or Combox). It is connected directly to the headunit. This means that AUX-In connection with USB socket is always connected directly in the Headunit High.

Music track

If USB media are connected to the Headunit High via the USB interface, the headunit saves the track information of these USB media. The track information of up to four USB sticks or up to about 40,000 tracks can be saved in the vehicle in this way. If a fifth device is connected or more than 40,000 tracks stored, the information from existing tracks is deleted.

Video streaming

With the introduction of the Headunit High there is the option to play video files in different container formats (see 4.3.1) in the headunit and to display them on the CID. The video image is shown on the front control display and only when the parking brake is activated or in gear position P. The sound track of the video file can only be played if no audio medium (e.g. MP3 player) is connected via the jack plug of the AUX-IN connection.
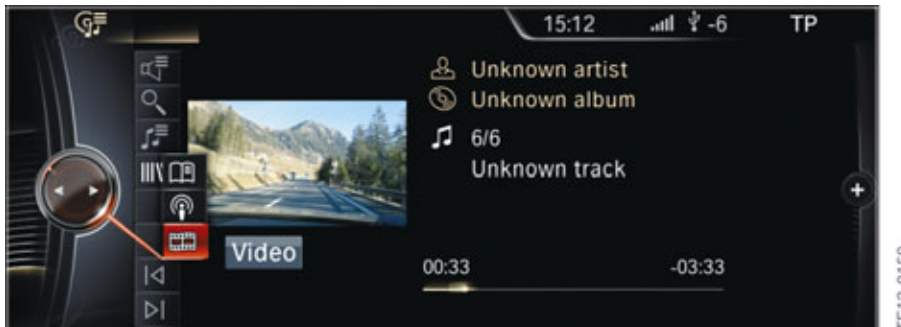
Video file playback via "external devices"

Headunit High

5. Functions

File systems

Popular file systems for USB devices are supported for the data import/music player function. The FAT 32 and NTFS formats are **recommended**.

⚠️

The following systems are **not** supported for data import: MTP, iDevices (iPhone®, iPod®, etc.) and HFS formatted USB sticks; **The data backup/data export of the music collection (backup) is not supported on USB devices with NTFS partitioning!**

Recovery (backup) of a music collection from the CIC to the Headunit High is not possible with these devices!

USB 3.0 is currently not yet supported. However, USB 3.0 end devices are downward compatible and thus compatible with the USB 2.0 socket installed in the vehicle. The maximum speed is then reduced to the USB 2.0 standard.

Smartphone

Audio and video files can be played with appropriate telephone equipment (telephone optional equipment with the SA6NF connection for Smartphone) via the Headunit High. It is important to ensure that the proper snap-in adapter is used. For example for the Headunit High in conjunction with the iPhone® 4S only the "Media" snap-in adapter or "Media with fan" can be used.

External streaming sources

In the "Settings" menu under the "Connections" submenu the different streaming media can be connected.
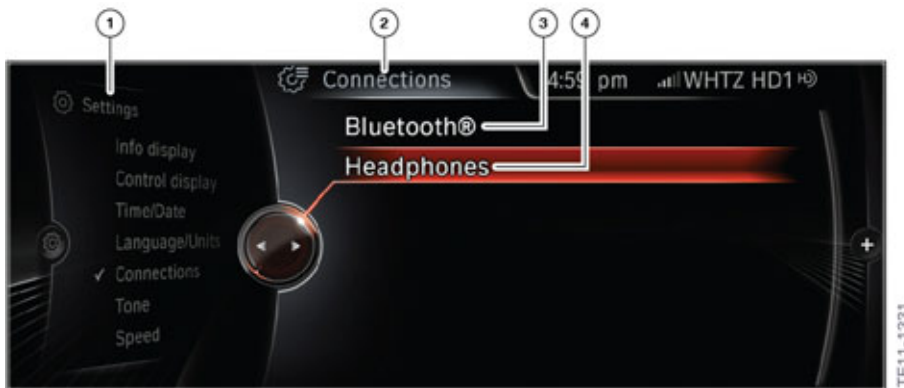
"Settings" menu - "Connections"

Index	Explanation
1	Settings main menu
2	Connections submenu
3	Bluetooth
4	Headphones/Remote key

Headunit High

5. Functions

Bluetooth audio streaming

The Bluetooth audio streaming introduced with the Combox, a Bluetooth audio connection between a cell phone and end device, was fully integrated into the Headunit High.

As with CIC the standard audio video remote control profile **AVRCP 1.3** is used for the introduction of the Headunit High. This means that the metadata such as artist, album, track, etc. can still be displayed. "Browsing" will only become available with version 1.4 (AVRCP 1.4 is planned for later in production as an enhancement to the current version).

5.3. Radio

5.3.1. FM/AM

Radio menu with activated FM tuner

In the FM area interpretation and track are now shown for the first time for an active RDS function under Entertainment Details (split screen) and in the so-called player screen. A prerequisite is that the active station supports the radio text or radio text + function.


FM menu with new symbols

5. Functions

Index	Explanation
1	FM stations
2	Stored stations
3	Next station
4	Last station
5	List of stations, constantly updated by 2nd FM tuner

Web radio

If "BMW Apps" is started in the ConnectedDrive menu and then the corresponding App is started on the iPhone[®], the menu item Web radio can be activated. Web radio is then integrated into the "Radio" menu, in addition to FM, AM, etc.
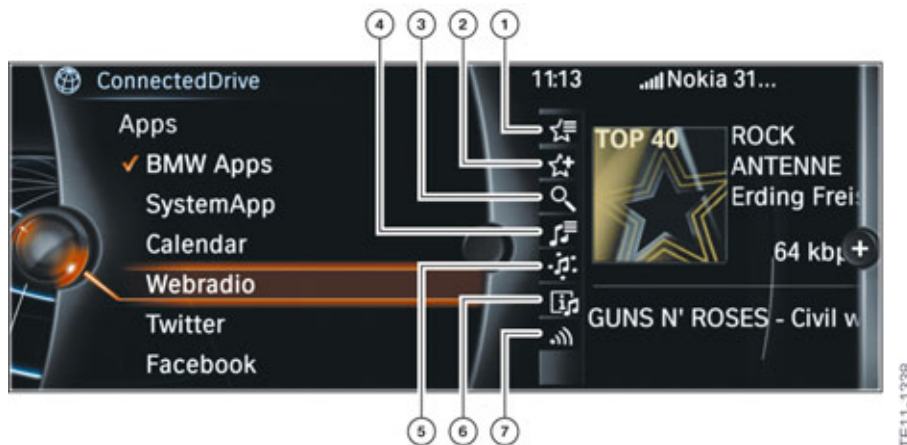
Web radio active via the iPhone[®] for corresponding App and SA6NR

Index	Explanation
1	Favorites
2	Delete from favorites
3	Search stations
4	Last results
5	Similar stations
6	Station details
7	Audio quality

Headunit High

5. Functions

5.4. Navigation

5.4.1. Map view

To improve the search for settings for map options, these have been integrated from the option menu to extended symbol bars. These extended symbol bars are always positioned above the last shown symbol bar. Using the mouse-over effect the function of the symbols can be shown briefly upon selection.

Extended symbol bars

Index	Explanation
1	Main symbol bar, symbol for map views
2	Extended symbol bar with map views and map details
3	Symbol for more info
4	Symbol "Show special destinations"
5	Symbol bar with special destinations, traffic info, satellite images and "3D effect" perspectives

5.4.2. Interactive map

The interactive map has been complemented with some functions. After selecting the interactive map the following settings can be performed:

- Change scale: Turn controller.
- Move map: Tilt controller in the corresponding direction.
- Move map diagonally: Tilt controller in the corresponding direction and turn controller.

Headunit High

5. Functions

The new symbols mean:

Improved interactive map

Index	Explanation
1	Special destination in the vicinity: Search for special destinations has started.
2	"Show details": details about the destination can be displayed here.
3	Start route guidance or add destination.
4	"End interactive map": Changes back to the map view.
5	Map views.
6	"Show location": Map section around the current location is shown.
7	"Show destination": Map section around the destination is shown if route guidance is active.

5.4.3. POI brands and weather icons

The new Navigation has the ability to display icons for POI Brands and weather information.

The Points of Interest (POI) icons are currently limited to fuel stations (icon of brand) and BMW Centers (shows BMW Roundel).
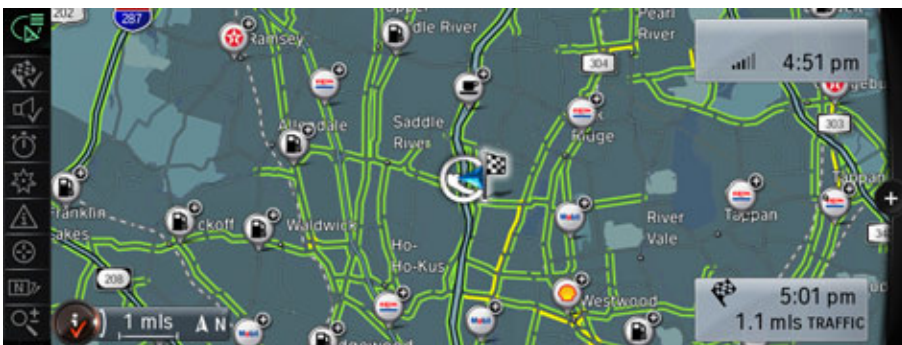
These icons are available from map scales 40 ft – 1 mile. As the user zooms into or out of the map, the icons will be automatically adjusted to include as many as possible, but without cluttering the screen.

Users can also view weather information icons in the map overview.

This feature is standard with Navigation system and not tied to any BMW Assist Plan.

Headunit High
5. Functions

These icons are available from map scales 10 miles – 250 miles. As the user zooms into or out of the map, the icons will be automatically adjusted to include as many cities as possible but without cluttering the screen. This feature is only available as part of the BMW Assist Safety Plan.

5.4.4. Advanced Real-Time Traffic Information (ARTTI)

The Advanced Real-Time Traffic Information (ARTTI) of BMW ConnectedDrive developed for BMW navigation systems increases reliability and precision in the creation, communication and use of real time traffic situations for the purpose of route computation and appropriate diversion recommendations.

Advanced Real-Time Traffic Information (ARTTI) is different from Real Time Traffic Information (RTTI). ARTTI is available exclusively with BMW's newest navigation system (available on selected 2013 Model Year or later vehicles) while RTTI has been available since as far back as 2006.

ARTTI is a further development of the previous traffic information system (from ConnectedDrive), RTTI Real-Time Traffic Information. The most important advantages of ARTTI over the RTTI are quicker and more comprehensive data transfer via mobile radio and the SIM card integrated in the vehicle in the TCB control unit. As well as covering highways, the new system also includes national roads and numerous inner city connections.

ARTTI is only available on vehicles equipped with Navigation system (SA 609) and in combination with optional equipment BMW Assist (SA612) and a valid ConnectedDrive contract (Safety Plan).

In addition to the information sources used by RTTI in the determination of traffic situations (traffic messages from the police and traffic jam sensors), movement profiles of cell phones made anonymous and the data from traffic control systems are taken into consideration in ARTTI. The movement profiles are determined with the aid of specific road users (e.g. truck fleets, taxis, etc.) whose navigation systems are linked to a control center. The traffic data are made available about two minutes after the headunit is started. ARTTI is updated every 3 minutes to ensure that customers always get the latest traffic information and, when the navigation's dynamic guidance feature is turned on, the system will offer routes for rerouting around traffic jams of 5 minutes or longer.

With ARTTI the traffic flow is depicted in the traffic flow map using different colors:

- Green: flowing traffic (recommended speed limit)
- Yellow: traffic slowing (< 50% of recommended speed limit)
- Orange: stop and go traffic (< 25% of recommended speed limit)
- Red: traffic jam (<12.5% of recommended speed limit)
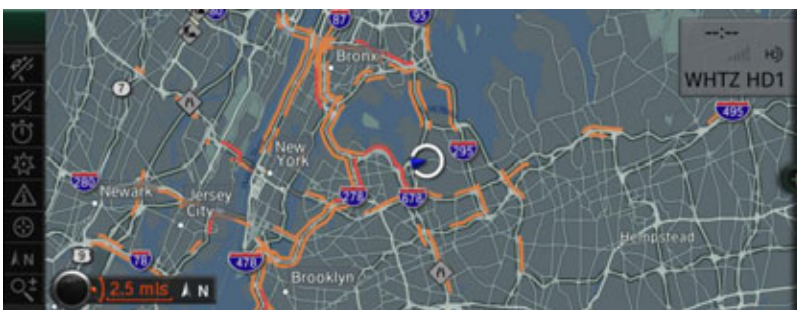
Headunit High
5. Functions

Look at the following two graphics for comparison between RTTI and the new ARTTI system.

ARTTI screen

The "green" color for traffic information is unique to the ARTTI system.

RTTI screen

There is no "green" color used for traffic information in RTTI, only red, orange, and yellow.

Below please find the map which shows the traffic flow in full image format. The Traffic Info symbol can be found in the symbol bar.
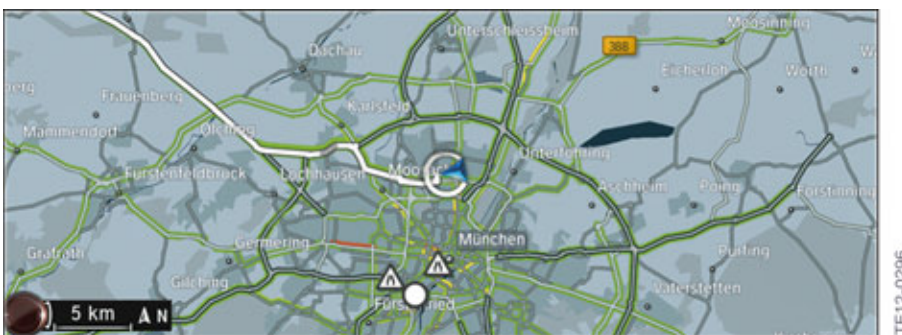

Diagram of traffic flow in traffic overview (Traffic Info menu) with active ARTTI

Recommended diversion

If disruptions occur on the computed route with a calculated delay of less than 20 minutes, the traffic information symbol in the symbol bar is displayed in yellow. If the delay is calculated at more than 20 minutes or if there is a road closure, the symbol is displayed in red. If a diversion is sensible on the basis of the current traffic situation and the associated disruption, this is recommended to the driver. The extra mileage for the recommended diversion and the estimated time saving are displayed.

Headunit High

5. Functions

ARTTI availability for 2013 Model Year vehicles is:

- 7 Series (standard)
- 5 Series (optional on 528i and 535i, and standard on 550i and ActiveHybrid5)
- 5 Series GT (optional on 535i, and standard on 550i)
- ActiveHybrid3 (optional) only, no other 3 Series have ARTTI for 2013

Note: All other vehicles will continue to have RTTI available.

5.4.5. Route guidance

ECO Pro route

Alternative routes can be selected under the menu item "Route criteria". Here in addition to the "current route" an "alternative route" and an ECO PRO route are also offered. An ECO PRO route is a consumption-optimized route calculated by the combination of the lowest possible consumption and fastest routes.

Alternative routes

| Index	Explanation
1	Selection symbol – Alternative route
2	Alternative route
3	ECO Pro route

Headunit High

5. Functions

The new ECO PRO routing can provide the user with the most fuel efficient route, and can even estimate how much fuel this route will save you over alternative routes.
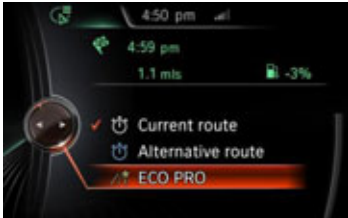
They now can select whether they want the system to consider express roadways and / or HOV lanes. (unavailable with previous Navigation Professional systems)
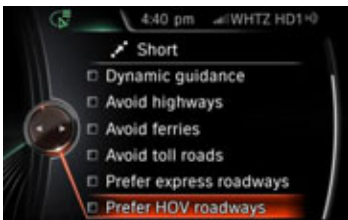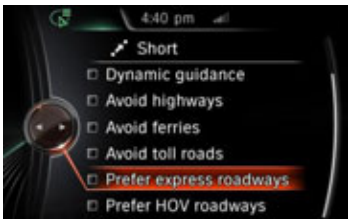
5.4.6. Stage destinations

For a journey with stage destinations a maximum of 30 stage destinations can be input. The stages can be stringed together in any way and resorted as desired. In addition, the journey can be saved on a USB stick. The stage destinations are now numbered and the planned route is in blue from the first stage.

Travel guide with individual stage destinations

Headunit High

5. Functions

Index	Explanation
1	Start point "Journey with stage destinations"
2	First stage destination
3	Second stage destination
4	Third stage destination
5	Blue journey with stage destinations

5.4.7. Enhanced guiding

As an additional function to "Lane guiding" for turn-off recommendation, the so-called "enhanced guiding" is a new feature. Here not only the correct lane is recommended to the driver in CID (split screen), instrument panel and HUD, but he is accompanied when turning off.

"Enhanced guiding" function

Index	Explanation
1	Vehicle approaches crossroads. "Enhanced guiding" Assist is shown on split screen.
2	Vehicle just before turn-off process
3	Vehicle at turn-off process

5.4.8. Updating navigation data

For the Headunit High the update of navigation data can be done via a **USB stick or DVD** depending on the market. The reason for the different versions is that the map of Europe for example had to be split over three DVDs due to its size. A USB stick with corresponding capacity is practical here. The navigation data (map material) can also be updated via ISTA programming as with all current BMW vehicles.

Headunit High

5. Functions

5.5. Telephone systems

5.5.1. Main and additional telephone

Phone book

Index	Explanation
1	A-Z search
2	Contact of one of the connected cell phones
3	Selection of what cell phone is to be used for the call
4	Contact in the address book of the Headunit High

With the introduction of the Headunit High a distinction is made between main telephone and additional telephone, with a few exceptions.

- The main telephone is generally used for contacts saved in the vehicle.
- If both telephones are connected to the vehicle at the same time, the contact details of both telephones are also visible in the Contacts menu (identifiable by the Bluetooth symbol behind the entries). The telephone to be used can be selected in the Options menu.
- The entries in the phone book of both registered cell phones can be selected via speech input.
- Up to 5000 contacts can be loaded from each cell phone **via Bluetooth** to the vehicle (i.e. a total of 10,000). In addition, a maximum of 1000 online contacts (from the ConnectedDrive portal of the customer) and 1000 contacts which can be stored on the hard disk.

Registration and connection

The previous submenu **"Bluetooth"** for registration and connection of a cell phone is now located in the "Settings" menu under the submenu "Connections". For details see Chapter 5.7.1.

#### 5.5.2. Voice input for Office

Message Dictation

"Message Dictation" is a feature that allows you to use "speech-to-text" to dictate emails and text messages. Speech is converted to text using the menu item "New" in the Office submenu. This done via a BMW server (also called "backend"), which sends the encrypted voice data to the service provider Nuance®. Nuance® then sends the message back as a text file to the headunit. This then

Headunit High

5. Functions

appears as text in CID. The text can then be sent as a **SMS or email** via the customers compatible cell phone. Usage of this service beyond the included 60-day trial period requires a separate subscription with Nuance. More information is available via www.nuance.com/bmw.
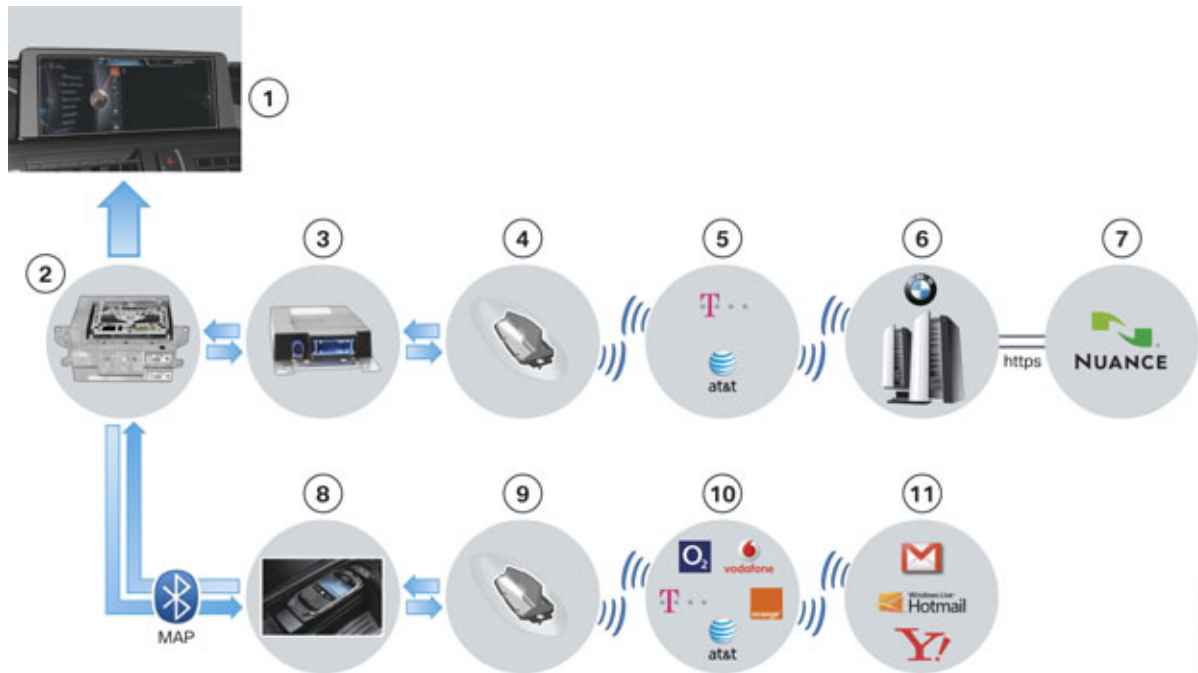
"Speech-to-text" workflow

Index	Explanation
1	Central information display (CID)
2	Headunit High (HU-H)
3	Telematic Communication Box (TCB)
4	External antenna, telematics
5	P-SIM service provider
6	BMW AG backend server
7	Speech-to-text service provider Nuance$^{®}$
8	Cell phone (supports the MAP Bluetooth standard)
9	External antenna, telephone
10	Customer's cell phone service provider
11	Customer's email service provider

About 30 seconds of spoken text can be recorded with one input. However, several dictations can be stringed together. This way an email can be dictated in several steps if desired.
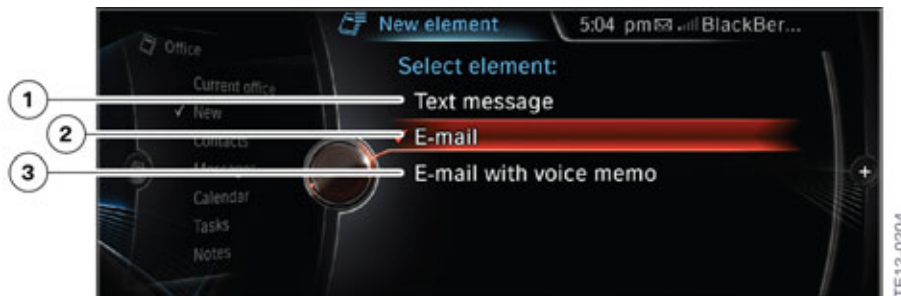
Headunit High

5. Functions

"Compose" submenu with the "Speech-to-text" function

Index	Explanation
1	Email
2	Receiver
3	Dictate text
4	Account 1
5	Send
6	Delete all entries

The text can then be improved using a word correction tool if required. After the text is sent as a SMS or email it is also possible to respond to an email with help of the "Message Dictation" function.

Select SMS or email

Index	Explanation
1	SMS
2	Email
3	Email with voice memo

Requirements

A prerequisite for the "Message Dictation" function is a **speech input system**. This is **no longer** activated via the SA620. The speech input system is connected to the telephone optional equipment SA6NL. In addition, the SA249 is still required for a multifunction steering wheel.

Headunit High

5. Functions

The "Message Dictation" function is **only** available for the SA6NL. The function is an additional service of ConnectedDrive but requires a Convenience Plan subscription. For new vehicles with ConnectedDrive a 60-day trial period is enabled. Usage of this service beyond the included 60-day trial period requires a separate subscription with Nuance. More information is available via www.nuance.com/bmw.

A cell phone is also required which is registered and connected to the vehicle. The cell phone must fully support the "Mail Access Profile **(MAP)**" Bluetooth standard. Some cell phone manufacturers only implement some of the MAP profile. For the launch of the Headunit High only select devices from RIM$^®$ satisfy this standard. A valid email address must also be added and a cell phone with a valid cell phone contract registered and connected as the cell phone is used as a modem for this service.

As of July 2012, the Message Dictation feature is only supported by the following devices:

- Nokia N8
- Blackberry 9300, 9700, 9800, 9810, 9860, 9900
- Samsung Galaxy S2
- HTC Sensation
- Motorola Milestone 2

Note: For further information regarding cell phone compatibility please refer to bmwusa.com/ bluetooth.

Voice memos

All notes from the cell phone and the notes included in the vehicle are shown in the menu item **Notes** allowing for their compatibility. The notes are then transferred from the main telephone and additional telephone.

Recording and exporting a voice memo

A spoken voice memo can be input in the vehicle using the microphone and recorded with the Headunit High. This voice memo (sound bite) can then be sent as an email attachment or saved in "Notes" as an audio file. Voice memos can also be exported via the USB port in the center console. This is done from the Options menu. An audio file is then stored on the USB stick in a .aac container.

⚠️

The Message Dictation feature is not available for the iPhone$^®$. The reason for this is that Apple$^®$ does not fully support BMW Office functions (Bluetooth profile does not support the transmission of Office data).

5.5.3. Office calendar display

The new headunit offers a graphic visualization of dates in the Office function similar to MS Outlook. The daily view and the navigation in the calendar have been simplified significantly. An exchange server connection is not available.

Headunit High

5. Functions

Schematic diagram of the calendar similar to MS Outlook

The monthly view also received a new look.

Schematic diagram of new calendar monthly view

⚠️

For the iPhone® (4, 4S) the calendar can only currently be accessed through (SA6NR) BMW Connected Calendar App. The reason for this is that the current Apple® iPhone® Bluetooth profile does not support the transmission of calendar data, for more information regarding BMW "Tested" phones please go to bmwusa/bluetooth.com.

⚠️

For some Blackberry phones in order to view the calendar it is necessary to install the "Bluetooth Calendar Sync" App, available for sale via appworld.blackberry.com, for more information regarding BMW "Tested" phones please go to bmwusa/bluetooth.com.

5.6. Telematic systems

5.6.1. BMW Online

For BMW Online the changeover to the new start page took place with the introduction of the F30 in 2012. This new menu structure can now also be found in the Headunit High. In the following series of images the example of Applications/Webcams was addressed. The applications with info characters vary depending on the country versions.

Headunit High

5. Functions

BMW Online

Index	Explanation
1	News
2	Weather
3	Google local search
4	Applications
5	Recently used
6	Settings

"Widgets" are new and can be activated on the split screen in addition to the online functions. These "Widgets" are small applications especially for the split screen of the CID. A clock display, sports results and stock exchange are planned for example.
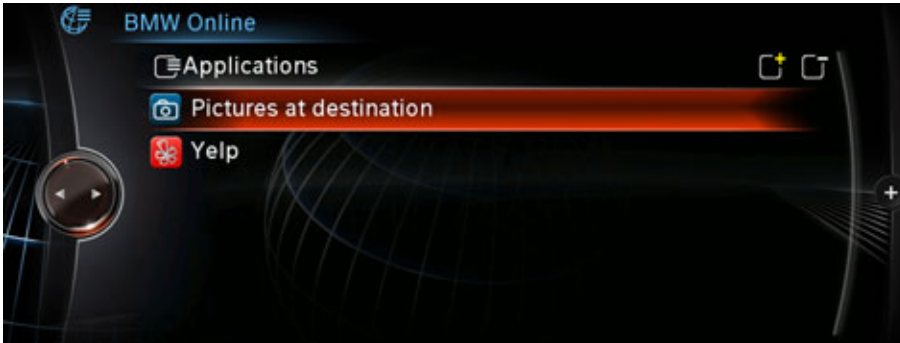

Widget clock display on split screen

Headunit High

5. Functions

New Applications

The ConnectedDrive Services is pleased to announce that "Yelp" and "Pictures at Destination" applications were recently added to BMW Online.

New Applications available on BMW Online

Pictures at Destinations is just what the name suggests.

You can display photos for several destinations when the route guidance is active.

Different photos can be selected depending on the range available. In this case, photos from the Internet service provider Google™ Street View and Google™ Panoramio are used.
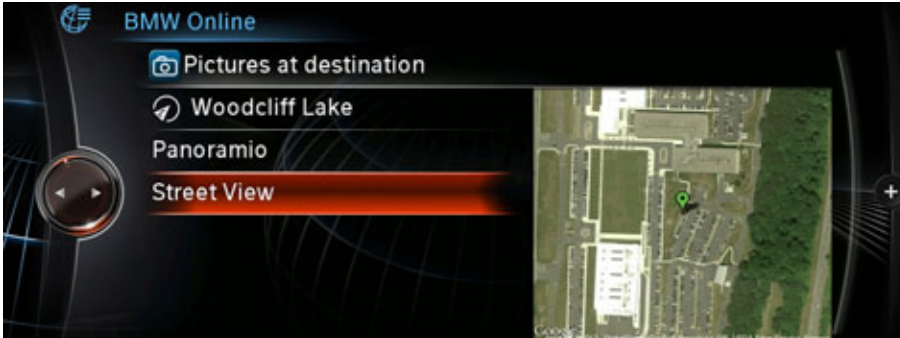
The Google™ Street View or Panoramio can be selected
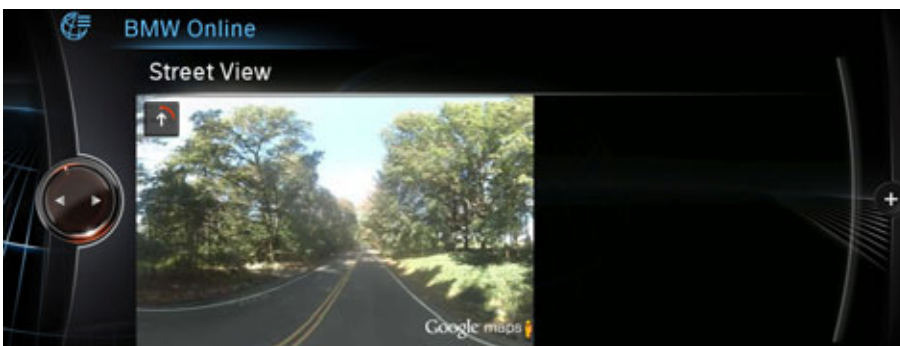
Google™ Street View

Headunit High
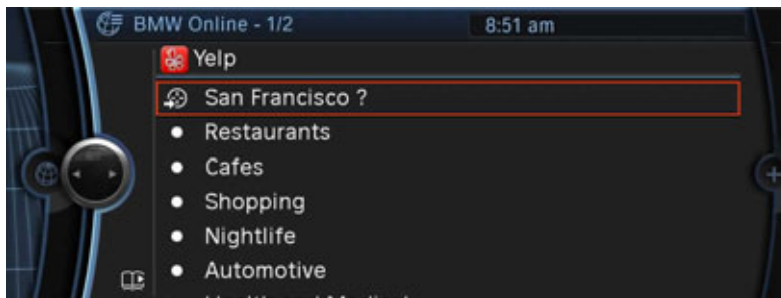
5. Functions
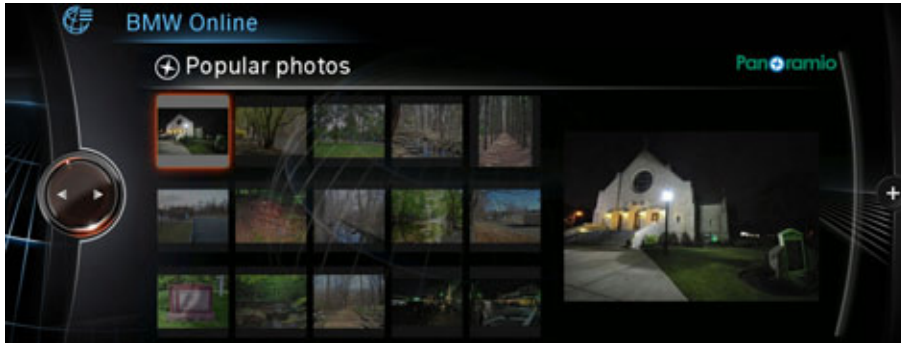
Google™ Panoramio view

⚠️

Route guidance must be active in the Navigation to display images.

"Pictures at destination" is only available for vehicles equipped with the Navigation system (SA609) and telematics.

With Yelp on-board, customers can search for everything from the best local restaurants and boutiques to parking garages and banks. They are able to see ratings for those businesses while hearing reviews read out to them via the vehicle's text-to-speech feature. With the recent update to BMW Online's layout, BMW can seamlessly add new features (known as "applications") as they become available. Yelp is the first such application and there will be more to follow.

Features

- Category Search – Search by category for nearby restaurants, cafes, shopping, nightlife, and more.

- Results Overview - Results are sorted by distance and show user-generated ratings of the places, category, and number of reviews.
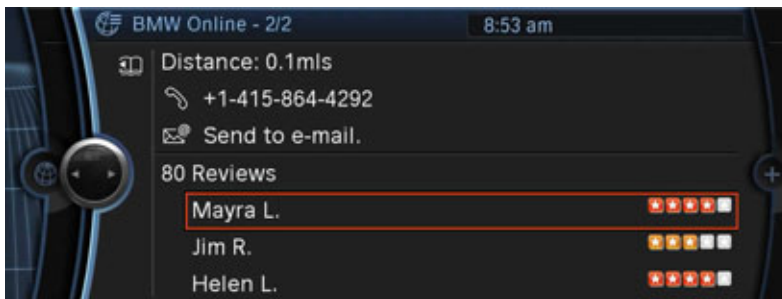
Headunit High

5. Functions

- Details – Selecting a particular place gives more details about it. Customers can see the rating, address, distance, phone number, and information about reviews. Additionally, they can email details of the business to themselves or any other email address.
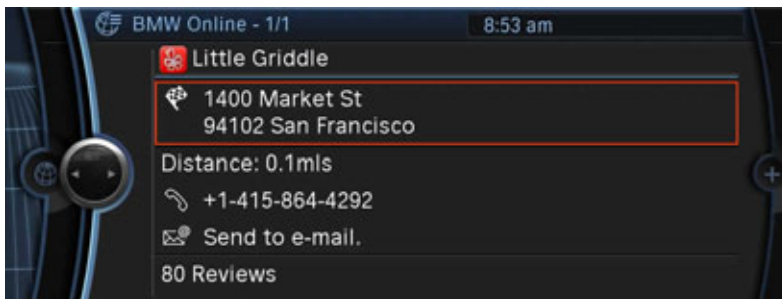
- Reviews – The 3 latest reviews are available for the business. The customer can select one of those reviews and have it read back automatically.

Adding new applications to BMW Online

Before we can use a new application like for example "Yelp", it must be added to the Applications menu in BMW Online.
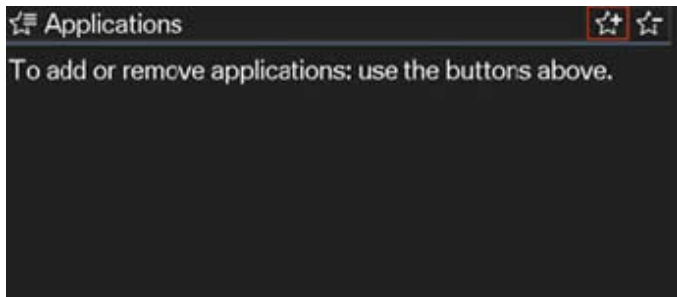
Headunit High

5. Functions

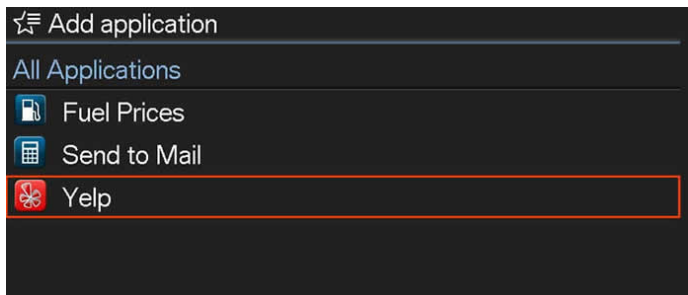**To add a new Application to BMW Online:**

1   Select the Applications menu.
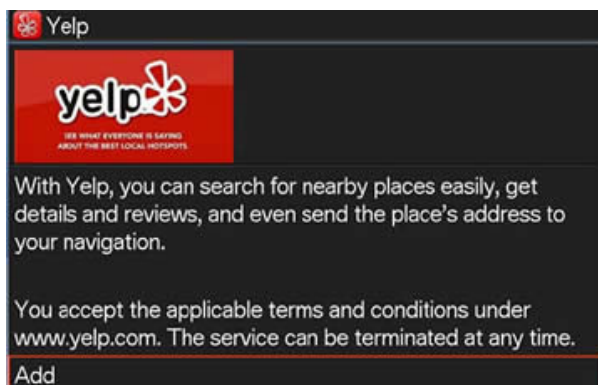

2   Select the "add" button from the upper-right corner.

3   On the "Add application" menu, select Yelp.

4   On the next screen, you will see a description of Yelp. Select "Add" to add Yelp.

5   You will now be able to access Yelp, under the "Applications" menu in the main menu.

Many of the new features require that the customer has an active subscription to the BMW Assist™ Safety Plan or Convenience Plan.

	US		Canada
	Safety Plan	**Convenience Plan**	**Safety Plan**
Advanced Real-Time Traffic Information (ARTTI)	X		X
Weather Icons in Navigation Map	X		X
Google™ Autocomplete Functionality		X	X
Pictures at Destination		X	NA
Points of Interest (POI) Enrichment		X	NA
Message Dictation		X	X
BMW Online Improvements		X	NA

⚠️

BMW Online is not yet available in Canada. Therefore, BMW Online Improvements such as Pictures at Destination and POI Enrichment, are also not available.

5.6.2. BMW TeleServices

Breakdown service

For the equipment with BMW TeleServices, support is provided firstly by the BMW Teleservice diagnosis and if necessary then by the BMW Teleservice help.

BMW TeleServices diagnosis

The BMW TeleServices diagnosis enables detailed vehicle data which are necessary for the diagnosis of the vehicle to be sent via mobile radio. This data is sent automatically. After the data is transferred a voice contact to BMW Group Mobile Service is established.

Headunit High

5. Functions

BMW TeleServices help

The BMW TeleServices help allows detailed diagnosis of the vehicle by the BMW Group Mobile Service via mobile radio. Upon request by the BMW Group Mobile Service and after completion of the voice contact the BMW TeleServices help can be started.

Available BMW TeleServices services in the ConnectedDrive menu "Service status"

Index	Explanation
1	Battery Guard
2	BMW TeleServices call
3	BMW TeleServices report

BMW TeleServices report

The BMW TeleServices report service is not active directly for the customer, but is shown on the CID upon completion. Measured values from the field are collected to introduce timely measures and to increase customer satisfaction. With regard to data protection no geopositions or personal details are sent.

The BMW TeleServices report is also used to quickly check and ensure that software measures have been implemented for the customer effectively. With regard to data protection no geopositions or personal details are sent.

BMW TeleServices Battery Guard

The BMW Battery Guard is an extension to BMW TeleServices where critical battery situations are forwarded to the dealer. If the battery voltage reaches the low startability limit this status is forwarded to the dealer through the TRS application, the dealer then is to contact the customer to arrange for the customers service visit in order to check out the state of the battery. The procedure should be handled in the same way any other Automatic Service Call is handled by the dealer. The purpose the system is to prevent a customer breakdown in the vehicle due to battery discharge/low voltage.
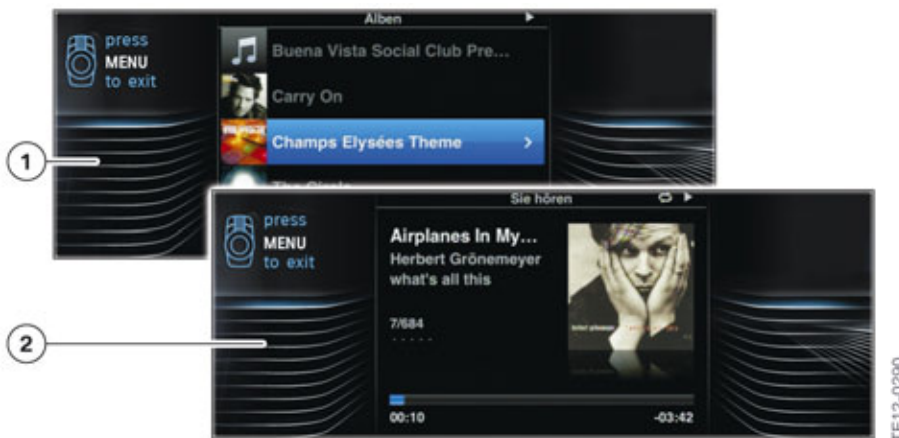
Headunit High

5. Functions

Diagram of BMW TeleServices and Battery Guard info calls at the service organization via ISPA Light

5.6.3. BMW Apps and plug-in

With regard to BMW Apps (SA6NR) and plug-in there is addition information in **"BMW Apps/ ConnectedDrive"** training material available on TIS and ICP. BMW Apps (Facebook, Twitter, Webradio), as well as the plug-in function, are described in detail there.

Schematic diagram of the plug-in function in the Headunit High

Index	Explanation
1	Album view in the plug-in function
2	Current track in the plug-in function

Headunit High

5. Functions

⚠️

In the Headunit High a mechanism which can differentiate between a phony video signal possibly fed by the hardware retrofitting (manipulation) and an original video signal is active. If the original video signal for plug-in from the iPhone® does not arrive within 10 seconds after activation of the plug-in in the headunit, a fault message appears in the CID. In this fault message the customer is notified that the telephone or snap-in adapter is to be connected again. The cause may be related to a possible contact fault on the analogue FBAS video signal line.

5.7. Vehicle information and settings

### 5.7.1. Integrated Owner's Manual (IBA)

Similar for the CIC there will also be an Integrated Owner's Manual (IBA) in the Headunit High. A variety of IBA animations are implemented in the HU-H.

⚠️

If a customer has activated muting for IBA animation by means of the volume controller, this muting can only be deactivated using the volume controller. Deactivation of muting using the iDrive controller is not possible!

5.7.2. Connections

To be able to register and connect a telephone via Bluetooth, the **"Connections" submenu** was created as a separate submenu in the "Settings" menu. If "Bluetooth devices" is selected in the option menu of telephone or contacts, the customer is instantly taken to the "Connections" submenu of the "Settings" menu.
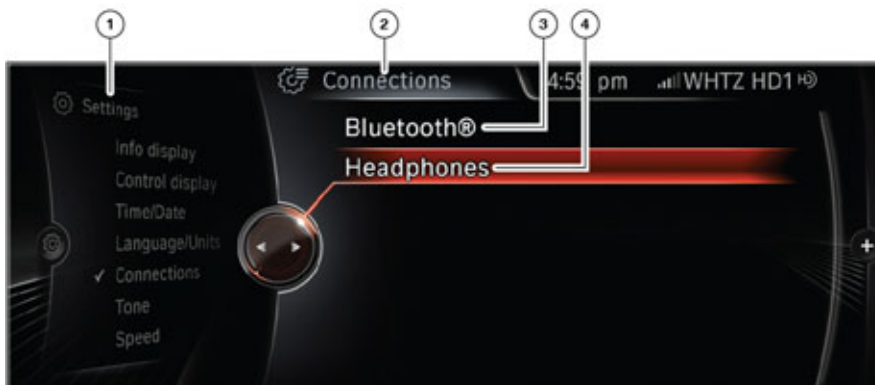
"Settings" menu - "Connections" submenu
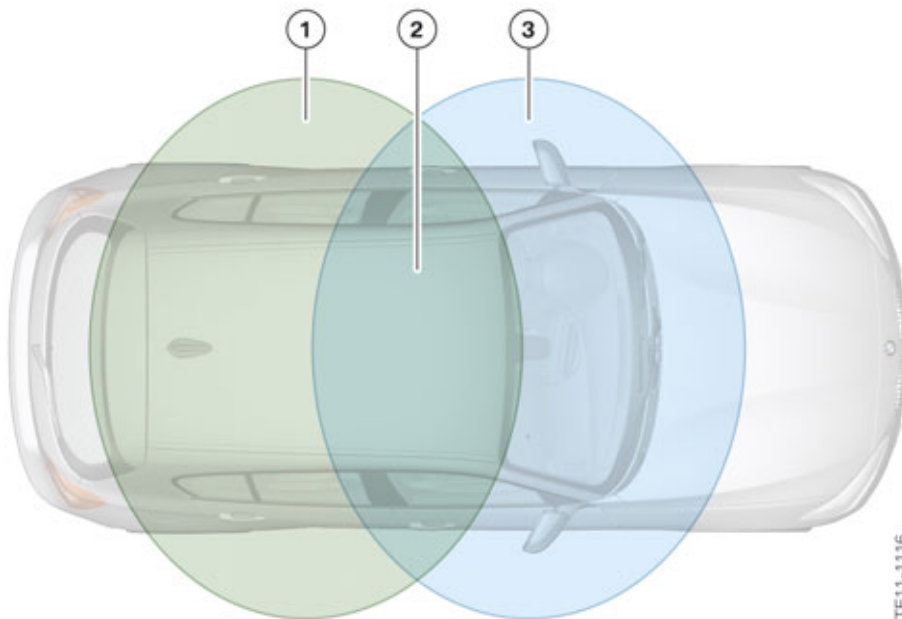
Headunit High

5. Functions

Index	Explanation
1	Settings main menu
2	Connections submenu
3	Bluetooth
4	Headphones/Remote key

5.8. Rear seat entertainment system

5.8.1. Zoning

To simplify the operation of entertainment devices for the customer in the driving area and rear area of the passenger compartment, a **simple control** was positioned for operating media with the zone distribution "zoning".

Media which is inserted or connected at the **front**, in the **driving area** of the vehicle, can be operated and played using the controller at the Headunit High. Media, which is inserted or connected in the **rear area** of the vehicle in the Rear Seat Entertainment system can only be operated and played using the rear controller. Broadcasting media such as radio and the DVD changer can be operated and played from **both controllers**.

Serving zones

Index	Explanation
1	Zone for rear passengers
2	Common zone for driver and rear passengers
3	Zone for driver and front passenger

Headunit High

5. Functions

Front passenger compartment	Device and medium
	CD/DVD inserted in DVD drive of Headunit High.
	USB stick inserted in the audio interface center console.
	MP3 player inserted in the audio interface center console (pawl).
	iPhone®, iPod®; inserted in the audio interface center console.
	Bluetooth audio streaming via the connected cell phone.
	BMW Apps (e.g. web radio) or plug-in (remote operation function iPhone).
	iPhone® via audio streaming using the hard-wiring in the vehicle; iPhone® was connected via a suitable snap-in adapter in the video base plate to the vehicle.

Rear passenger compartment	Device and medium
	CD/DVD inserted in DVD drive of RSE High.
	USB stick inserted in the USB socket of RSE High.
	MP3 player inserted in cinch socket RSE High.
	Paddle, camera or video camera inserted in the external device cinch socket (yellow, white, red) of RSE High.
	iPhone®, iPod® in USB socket RSE for audio playback (A4A Apple®Chip is available in RSE).
	iPhone®, iPod®; inserted in the external device cinch socket for video playback. Use Apple® cinch adapter for this.

Both cases	Device and medium
	Radio (FM, AM, HD Radio)
	Music collection
	Owner's Manual
	DVD changer

5.8.2. Serving function

To offer the rear passengers a special service, media can be served in the rear passenger compartment with help of the controllers and Headunit High.

In this regard, the "Rear passenger compartment" submenu is in the "Multimedia" menu. The left RSE unit, the right RSE unit or both units can be used to serve the media.

Headunit High

5. Functions

Serving option in the "Multimedia" menu, "Rear passenger compartment" submenu

Index	Explanation
1	"Rear passenger compartment" submenu
2	Rear passenger compartment, left
3	Rear passenger compartment, right
4	Rear passenger compartment, left and right

Then a choice can be made from a range of entertainment sources.

Select entertainment source from "Rear passenger compartment" selection menu

Index	Explanation
1	CD, rear passenger compartment
2	Music collection
3	External devices, rear passenger compartment
4	FM
5	AM

Then a media transmission from the Headunit High is announced in the rear passenger compartment display. The medium is started or transmitted shortly thereafter.

Headunit High

5. Functions

5.8.3. Connect headphones

As stated in Chapter 4.7.2, the new headphones can be connected to the vehicle via radio. This function can be found under the "Settings" menu - "Connections". Here after switching on the headphones and pressing the iDrive controller at the entry "Add new device", a new headphone set is connected. After confirmation of the question whether the headphones are to be used with the right or left unit of the rear seat entertainment system, the connection setup is performed. In this regard, the ID of the headphones is shown on the CID.

Connection process for wireless headphones

Index	Explanation
1	"Connections" submenu
2	Add new device
3	Activate registration – Connection is setup
4	On which side the headphones are to be used (right, left)
5	Successful connection to display of headphone ID

After the successful connection the headphones can change sides of the rear seat entertainment system, be renamed or removed.

Headunit High

5. Functions

Setting options after successful connection of the headphones

Index	Explanation
1	Switch side
2	Rename
3	Remove device
4	New name of headphones (e.g. OTTO)
5	Sample name OTTO instead of headphone ID

⚠️

Note: Only original wireless BMW headphones can be used.

The pervious systems headphone will not work with the new system.

Bayerische Motorenwerke Aktiengesellschaft
Qualifizierung und Training
Röntgenstraße 7
85716 Unterschleißheim, Germany